



FRIDAY, MAY 2, 1879.

Contributions.

Paris Exhibition—Electricity as Railway Appliances

TO THE EDITOR OF THE RAILROAD GAZETTE:

An automatic, electro-magnetic apparatus, which provides for protection against accidents that may result from the disobedience of signals by the locomotive runners, either from their negligence, or from meteorological causes, was exhibited by the Northern Railroad Company of France, at the last International Exhibition in Paris.

No matter how perfect may be the system of signals protecting railroad trains against accidents from collision at the railroad crossings, junctions, or on switches, absolute security is thought by many to be out of the question. But every-

thing is constantly being perfected, and human fallibility is being more and more checked by the skillful application of physical forces and the science of mechanics, the truth of which finds new evidence in the apparatus which is the subject of the present article.

Railroad men should, by this time, be well acquainted with the interlocking system of signals and switches, which makes it impossible either to misplace switches or give conflicting signals, eliminating entirely errors of the switch and signal tender. Accidents resulting from wrong signaling are thus out of the question, if the necessary precautions are taken. But it is not generally known that obedience to signals may also be effected mechanically by automatic action, so that a railroad train will be arrested in its motion by a signal of danger, even without the intervention of the locomotive runner. The most perfect apparatus which produces this effect is, so far as known to me, that of Messrs. Lartigue, Forest & Digne Bros., which, after successful trials, has been adopted by one of the most important railroad companies of France.

The company formerly had signals with attachments of electric bells only, which gave audible alarms whenever the signals showed danger, thus giving notice of their position.

But even with the best attention of the locomotive run-

ners the signals sometimes cannot be distinguished, on account of heavy fogs, snow or rain, and an electric bell may not be heard. To remedy this, the inventors, who have already made such an excellent use of electricity in applying it to the electric-semaphores, have no less successfully applied it to the apparatus in question.

In fig. 1 of the accompanying engravings, the signal (it may be a disc or a semaphore) acts by its motion on a circuit-closer which communicates with the negative pole of a battery placed at the foot of the signal; the positive pole of this battery communicates by wire with the electric bell (which, however, has nothing to do with the automatic apparatus) and with a fixed "contact," *F*, placed at a required distance from the signal. This "contact" consists of an iron bed-plate, placed longitudinally in the centre of the track, covered by a wooden board which is coated with an insulating material, on the top of which is placed a strip of copper. This last connects with wire of the positive pole of the battery, as stated.

The action of the circuit closer is such that when the signal shows danger, the negative pole of the battery is set in communication with the earth, and vice versa.

On the locomotive is attached the apparatus shown in fig. 2, which consists of a Hughes electro-magnet, *A*, acting on a lever, *B*, one end of which is pivoted, while the other end is attracted by the pallet of the electro-magnet. With the lever *B* is rigidly connected another lever, *E*, so that they

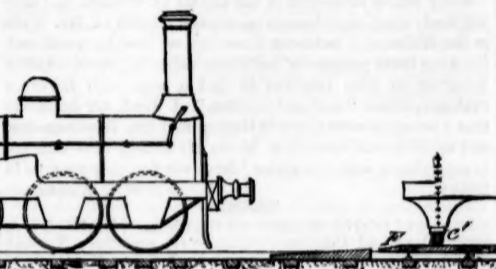


Fig. 1.

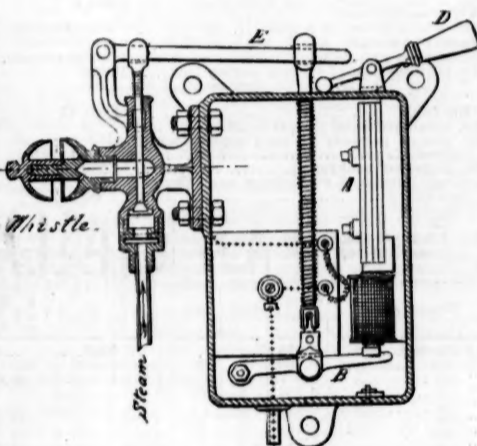


Fig. 2.

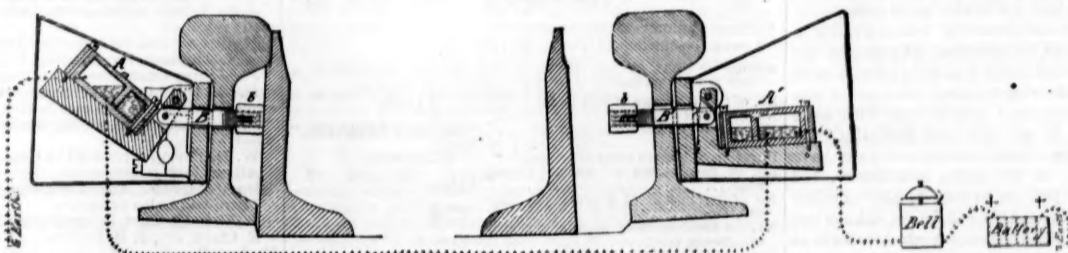


Fig. 3.

power of the magnet, and sets the whistle and brake in action.

A lever, *D*, serves to replace the lever *B* in its former normal position. The apparatus is placed in a metallic casing, and attached to the cab of the locomotive.

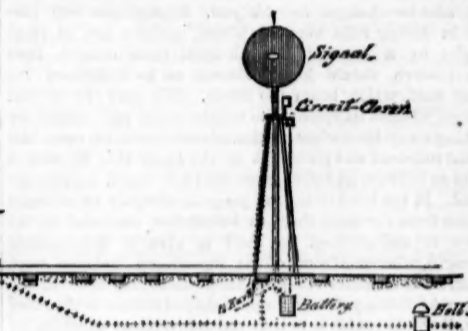
In climates where snow may cover the fixed contact if placed on the track, and thus prevent its operation, it should be placed by the side of the track, and high enough to assure its action.

In 1872 the Northern Railroad Company had 45 locomotives provided with this apparatus; last year the number reached 300, and the apparatus will finally be applied to all its engines. It has never failed to act, not even at the highest attainable speed of the locomotive, and, as stated by the officers of the company, it has prevented some serious accidents.

Another not less interesting exhibit of the Northern Railroad Company was an indicator for switches operated at a distance, which is illustrated in fig. 3. Its object is to indicate by an audible signal if the point of the switch is close to the rail or, as it is called, "home." On the outside of the rails, and opposite the extreme ends of the switch, are attached two circuit-closers, *A* and *A'*, which are an ingenious invention of Mr. Lartigue. The circuit-closer consists of a water-tight box made of insulating material, which is divided by a partition into two cells; the cells communicate with each other by a small hole made at the bottom of the parti-

tion, and are half-filled with mercury. The mercury is the medium which establishes the communication between two contacts of an electric circuit. This is effected as follows: Two ends of the broken wire which communicates with one pole of the battery are introduced into the bottom of the larger cell of the circuit-closer. The latter in a horizontal position will, by means of its mercury, establish a communication between the ends of the wire—which will be easily understood by referring to the circuit-closer *A'* of the illustration, in which the wire is shown by dotted lines. If the circuit-closer is in a tilted position, as shown at *A*, the communication between the wire ends is broken. The object of the partition which divides the box into two cells is to regulate automatically, by means of the size of the hole which is made in it, the time for closing or breaking the circuit. The circuit-closers are attached to a kind of rocking shelves, hung from pivots below which they carry tappets, *B*, *B'*, pivoted to them and provided with heads, *b*, *b'*, as seen in the illustration. The operation of the apparatus will now be easily explained.

The positive pole of the battery is connected by wire with the electric bell and the two circuit-closers of the switch that have been described; hence the wire is carried to the earth.



The negative pole of the battery is connected directly with the earth. If the switch is "home"—position shown in the illustration—the circuit-closer *A* has broken the connection, and thus no electric current exists, which would agitate the bell. But if the switch is moved, the circuit-closer *A* takes the horizontal position, and the electric current being then established the bell sounds an alarm, which exists until after the switch is moved home on the other side, and the circuit-closer *A'* tilted by the point of the switch.

There are other applications of this ingenious circuit-closer, used by the same railroad company, namely, a "water-level" and an "automatic pedal alarm for an approaching train."

Railroad Malconstruction.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Men who take an interest in the progress of American railroads and are conversant with the history of improvements that have been introduced since the days when Boston was "the Hub," will be pardoned if they exhibit something of pride at the degree of perfection to which our roads have been brought at this date, but, however satisfactory our present system may be to a large class of managers, there is yet room for improvements that many of our live men would not be

slow to take advantage of if once brought forward and tested. Among the many things needed may be mentioned an improved rail section. Although the form of rail now in use has given general satisfaction and has many good points in its favor, it does not quite come up to the requirements of a perfect rail. Perhaps no better form could be devised which would give it greater strength in proportion to its weight if the vertical strain were brought upon it through its centres, as it should be. A great deal of ingenuity and fine drafting have been expended in devising a "standard" rail section, and rails have been produced that would be very nearly perfect, if they were properly placed in the track. The aim of the engineer in designing a pattern is to give it the form that will be capable of the greatest resistance, both laterally and vertically, and also to prevent excessive weakening from wear. On some of our roads these conditions are fulfilled, but on many they are not. It is obvious that in order to get the maximum of wear out of a rail it should receive its load centrally along its surface and not on the inner half, as is often the case. A recent examination of the rails on a new road showed the wear to be all on the inner half, and with a comparatively light traffic they are already "breaking down" on the inner half of the surface. An examination of wheels of local trains on this road showed a corresponding wear; that is, only a very narrow portion of the tread exhibited any indications of wear.

Of course the portion of the rail surface exposed to the

Trunk Line Executive Committee, which has for its object the further perfection of the plan adopted by the Western roads at Chicago.

A copy of this report, which has been approved by the presidents of the trunk lines, is now submitted to this convention for their joint action.*

A distinguishing feature of this report is its recommendation of the principle of pooling and that of arbitration.

A failure to put the latter in force has been the chief cause of the trouble experienced in carrying out the object of the Saratoga agreement of last summer.

It is the object of this meeting to get the approval of the Western roads to the report of the Trunk Line Executive Committee, and to select the Board of Arbitration contemplated by that report.

In addition to this, the details of carrying out the east-bound pool will have to be perfected. Heretofore, the proper organization of such pools has been put off until the last moment, when it was impossible to perfect an organization to carry out so important and complicated an operation.

If pools are to be in working operation by next fall, the work of organization ought to be commenced at once. Heretofore, no concerted action has been had upon this subject. The accounts kept at the various pooling places are merely between the initial lines. In order to make a pool effective, the traffic has to be divided from the initial points to points of destination, embracing all routes in the division, of which there are more than three hundred, from the principal shipping points West to the East.

I would recommend that accounts be at once kept from all pooling points, whether pools are put into effect at once or not, so that in a few months statements could be prepared and laid before the interested parties, showing the quantity of freight to be divided, as well as destination of freight, and the route by which shipped. Such statements are absolutely necessary, in order to make an equitable division of traffic. Similar statements are now kept, from Milwaukee and Chicago, and their value will be appreciated when the question of dividing traffic is considered.

It may not be possible to get the consent of all Western roads to act upon this matter at once, but this should not interfere with the action of the roads that can agree upon these measures.

Other matters will require the attention of the Joint Executive Committee, the most important of which is the adoption of proper measures to abolish, hereafter, the system of making time contracts. It is unnecessary to state the absolute necessity of such action, and adherence to it in the interest of all the roads.

This convention will also have to consider what measures should be taken to keep the roads east of Chicago, St. Louis and the Mississippi River from being affected by the disruption of the Southwestern Railway Association.

The war of rates should be confined to the roads with which it originated, and should not be allowed to spread throughout the whole territory east of the Mississippi River.

Another subject will be brought before this convention, namely, the revision of both east and west-bound tariffs, with a view of preventing the extension of the low rates, made from Chicago, into the interior of the country.

A communication from the President of the Baltimore & Ohio Railroad, upon this subject, will be laid before you.

There has been some difficulty between the roads concentrating in Buffalo, in maintaining the rates from Buffalo to the West. If this be continued it, may ultimately affect the through rates from the Eastern cities. It is hoped that these roads will restore their local rates and maintain the same, as the demoralization of the through rates, upon the larger business from the East, would greatly injure them, as well as the whole railroad system of the country.

Such other business will be transacted as may be brought before the meeting by its members.

The Secretary will now read the report of the Trunk Line Executive Committee, of March 6, to the Presidents, upon the Commissioner's report on the resolutions offered by Mr. Garrett.

The report was read by the Secretary.

Mr. Blanchard then addressed the meeting in support of the report of the Committee, giving the reasons which lead to its adoption, and the necessity for prompt action.

The following resolution was then unanimously adopted: "Resolved, That the report of the Trunk Line Executive Committee to the presidents be adopted by this meeting, as expressing the sense of the Joint Executive Committee."

Mr. Blanchard offered the following resolution:

"Resolved, That the Western roads be requested to designate a substitute to attend the meetings of the Joint Executive Committee in their absence, in accordance with the 3d article of the report."

Unanimously adopted.

In accordance with the foregoing resolution, Mr. Simpson announced that Mr. McCullough would act in his stead in his absence.

Mr. Hopkins stated that he was unable at this time to name a substitute.

Mr. Hurlburt also stated that he was not prepared to name substitutes, but that his roads would be represented at every meeting.

The Chairman stated that, in accordance with the second article of the report, President Vanderbilt had named Messrs. Rutter, Newell, Ledyard and Tillinghast to represent his roads on the Joint Executive Committee, reserving the right of having the four roads represented by Mr. Rutter alone. That Vice-President Roberts had named Messrs. Cassatt and McCullough to represent the roads controlled by his company, reserving the right of being represented only by Mr. Cassatt for all; that President Garrett had named Mr. John King, Jr., as the representative of the Baltimore & Ohio Railroad on the Joint Executive Committee, and that Mr. King would also represent the Marietta & Cincinnati and Ohio & Mississippi roads.

The Convention then took up the question of a selection of a Board of Arbitration, in accordance with the following recommendations contained in the report of the Trunk Line Executive Committee above referred to:

"In view of the differences likely to arise in said Joint Executive Committee, we further urge, as an essential to any permanently successful results, the distinct adoption of the principle of arbitration; and, in order to carry it into effect, we further recommend that a permanent Board of Arbitration be appointed by the said called meeting of the Joint Executive Committee, which Board shall continue in permanent session at New York."

That any differences, of whatever nature, arising in said Joint Executive Committee, in the formation of such pools, or in any matter, act or thing relating thereto, or to the maintenance of rates in the absence of pools, upon which the Joint Executive Committee is not unanimous, shall be promptly referred to the said Board of Arbitration; and the decision of said Board of Arbitration, or that of a majority of its members, shall be final and binding upon all parties, until changed by unanimous agreement of

the Joint Executive Committee, or by the said Board of Arbitration."

It was then unanimously

"Resolved, That each member of the Joint Executive Committee propose by ballot the names of such parties as he desires to nominate as arbitrators."

A ballot having been taken in accordance with the foregoing resolution, Mr. Newell offered the following:

"Resolved, That a committee be appointed consisting of the representatives of the trunk lines and the Chairman, to canvass the names just balloted for, and to recommend from those names, or any others which they may agree upon, the three gentlemen to serve as arbitrators."

which was unanimously adopted.

A recess was then taken.

The convention met after recess at 3 p. m.

Mr. Blanchard reported that the Committee, after consideration of the subject of the appointment of a Board of Arbitration, submitted the following names:

Charles Francis Adams, Jr.,

David A. Wells,

John A. Wright,

which selection was unanimously adopted; Mr. Beach stating that he did not feel authorized to vote.

Other names were submitted in case any of the elected parties declined to accept, which were also approved.

Mr. McCullough offered the following resolutions:

"Resolved, That the Executive Committee of the Trunk Lines be appointed a committee to notify the parties nominated this day as the Board of Arbitration, of their unanimous choice by the Joint Executive Committee, and that the Trunk Line Executive Committee be authorized to arrange the details and terms of their appointment."

"Resolved, That the salaries to be paid the members of the Board of Arbitration be paid by the several roads represented on the Joint Executive Committee pro rata on the gross earnings from the competitive business, to be ascertained and proportioned by the Chairman of the committee."

Adopted unanimously; Mr. Beach declining to vote for the reasons already stated.

The Chairman stated that, in the absence of any member of this committee, he was authorized and directed, by Article 11, of the Rules of the Joint Executive Committee, to vote for such absent member, and, in accordance therewith, he would vote in the affirmative on the above resolutions, for the absent members, and for the representatives not authorized to vote.

The Chairman stated that the next question to be considered was the sixth recommendation of the Trunk Line Committee, which reads as follows:

"That the Presidents affirm the principle of pools, in both directions, upon all through freight and passenger traffic common to any two or more of the trunk lines, and direct their representatives on the Joint Executive Committee to call the full Joint Executive Committee together, at an early date, to perfect such pools, and adopt such rules and regulations for the maintenance of rates, and their enforcement, as the said Joint Executive Committee may deem just."

Mr. Cassatt thereupon offered the following:

"Resolved, That the different roads interested at the various pooling points heretofore agreed upon in the West shall meet as soon as possible, and endeavor to agree upon the percentages from such points, and, failing to agree, that they shall report the fact to the Chairman of this committee, who shall call a meeting as soon as the arbitrators have been appointed, for the purpose of making the divisions."

On motion of Mr. Newell, the foregoing resolution was laid on the table until other important business had been disposed of.

The Chairman called the attention of the meeting to the disruption of the Southwestern Railway Association, and, in reference thereto, read the following circular (No. 146), issued by him under date of April 14, and approved by the Executive Committee of the Trunk Lines:

"Commencing on the 15th of April, and until such time when rates are permanently established again west of Chicago and St. Louis (of which due notice will be given), all freight from seaboard cities and New England, destined for Missouri River points, Kansas City, St. Joseph, Leavenworth and Atchison, will be billed at the full proportion of the established through rates to St. Louis, Hannibal and Chicago only, without giving or guaranteeing a through rate to point of destination, except in case of shippers demanding such through rate, when the present full tariff rate will be inserted in bill of lading."

"Freight will be billed by the route by which it is directed. The order to divert Missouri River freight is, for the present, suspended; but the diversion of this freight between the lines east of the Mississippi River and Chicago, will be carried out as per existing agreement."

"For the Trunk Lines,

"ALBERT FINK, Commissioner."

The Chairman explained fully the present difficulties, growing out of the disruption of the Southwestern Railway Association, and showed that the roads east of Chicago and St. Louis had no interest whatever in this war of rates; that the business of these roads have been divided, as between the roads passing through Chicago, and those working via routes south of Chicago, and that as this division was being carried out, the roads west of Chicago and Mississippi River could not, by any possible adjustment of rates, affect the tonnage over their respective roads.

The Chairman further reported, that so far, all the roads east of St. Louis and Chicago had adhered to the policy of neutrality, except the Wabash, which, it was reported, had taken sides with the St. Louis roads, pro-rating with them on Chicago rates from New York to Missouri River points, from Toledo, and that the action of the Wabash might involve the reduction of rates throughout the territory east of the Mississippi River; that the business of the various roads in that territory was 96 per cent., while the business of the roads west of the Mississippi River formed only 4 per cent. of the whole business transacted by the lines represented on the Joint Executive Committee.

After consultation with Mr. Hopkins, in which he explained the difficulties of the position of his road, it was

"Resolved, That the Chairman be authorized to submit a proposition, in writing, as requested by Mr. Hopkins, stating the views of the Joint Executive Committee, to be laid before the Executive Committee of the Wabash Railway for their action, and that the Chairman be authorized and directed to promptly take such further action in the matter as may be necessary to prevent the roads east of Chicago or St. Louis being injuriously affected by the disruption of the Southwestern Railway Association."

On motion, adjourned till 11 a. m., April 24.

NEW YORK, April 24, 1879.

The meeting assembled, pursuant to adjournment, all the members named in yesterday's proceedings being present, except Messrs. Hopkins and Beach.

Mr. M. H. Smith stated that he had been directed by President Garrett to call the attention of the Joint Committee to the condition of east-bound rates, and asked whether full rates were being maintained by all the trunk lines in accordance with the instructions of the Presidents.

Messrs. Cassatt, Blanchard and Vanderbilt stated, in reply to Mr. Smith's inquiry, that full rates were being maintained over their respective roads, in accordance with the instructions of the presidents of April 11.

Mr. Blanchard offered the following:

"Resolved, That after April 25 the full inland rate shall be charged on all export freight from the West, and the rates to Boston shall not be less than they are to New York."

"Resolved, That the members of the Joint Executive Committee at once notify all their agents and connecting roads not represented at this meeting, and give instructions to carry out these resolutions, and that the Chairman also issue a circular notifying all Western roads of the action of this convention."

Unanimously adopted by the following vote:

Messrs. Vanderbilt, Blanchard, Smith, Cassatt, McCullough, Newell, Ledyard, Simpson, Hurlburt and Ferry, the Chairman voting for the absent members, in the affirmative.

The resolution offered by Mr. Cassatt, at the meeting of yesterday, was then taken up, and it was unanimously adopted.

The following resolution was unanimously adopted:

"Resolved, That the rate on dressed meat be made on the basis of one dollar from Chicago to New York, and corresponding rates to Philadelphia and Baltimore, on and after the 28th instant."

The Chairman called the attention of the meeting to a communication from President Garrett, addressed to the presidents of the trunk lines, in reference to the necessity of a revision of tariff rates on east and west-bound traffic, which communication was read.

The following resolution was then unanimously adopted:

"Resolved, That the general freight agents of the trunk lines attend the monthly meeting of the fast freight lines, to be held at the Gilsey House, New York, on Wednesday and Thursday next, and to submit to said meeting the request of the Joint Executive Committee, that the general freight agents take action upon the percentage table upon which rates are based, and particularly the communication from President Garrett, just read, upon this subject; and that, if practicable, they report to a meeting of the Joint Executive Committee to be held on Friday, May 2, upon this subject. And if the time allotted is not sufficient, that they appoint a committee to make recommendations to the Joint Executive Committee as speedily as possible."

A discussion then took place on the subject of the live-stock traffic, after which the following resolution was adopted:

"Resolved, That the Chairman call a meeting of the Joint Executive Committee on Thursday, May 1, to consider the whole subject of live-stock traffic, and that he invite to said meeting other interested parties."

On motion, the convention adjourned.

ALBERT FINK, Chairman.

ISAAC MARKENS, Acting Secretary.

Convention of the Southern Railway and Steamship Association.

The official proceedings of the special convention held in Atlanta April 10 and 11 show that representatives of 36 different railroad and steamship lines were present, some lines being represented by several persons, and directors as well as officers of some of the roads being present. Hon. Joseph E. Brown presided, and Charles A. Sindall was Secretary. On the morning of the 10th a committee consisting of E. W. Cole, President of the Nashville, Chattanooga & St. Louis, L. P. Grant, Superintendent of the Atlanta & West Point, E. P. Alexander, President of the Georgia Railroad, John B. Peck, General Superintendent of the South Carolina Railroad, and E. B. Stahlman, General Freight Agent of the Louisville & Great Southern, was appointed "to investigate the causes of the troubles in which we are now involved, and to suggest remedies for the same."

On the morning of the next day this committee submitted the following report:

"The committee appointed to investigate the causes of the troubles in which the Association is now involved, and to suggest a remedy for the same, beg leave to report:

"That they have heard the testimony of all the parties who are known to the committee as having been implicated in the causes which have produced the present reduction of rates, and have arrived at the following conclusions:

"1st. As to the Virginia & Tennessee Air Line: It was admitted by Capt. Thomas Pinckney, General Agent of that line, that on or about the first of February he did make a reduction of rates on shipments to Atlanta, on information satisfactory to him, that some of the associated had already made similar reductions.

"His information, however, was of such confidential nature that he declined to disclose either the name of the party furnishing it, or the line over which the reductions were made; hence, your committee are not able to judge as to whether any such reductions were really made or not.

"Your committee, therefore, while entertaining no doubt that the reductions were made for the reasons stated, and that the reasons were conclusive to the mind of Capt. Pinckney, must report that, in their judgment, the reasons given were not sufficient to justify the reductions made by the Virginia & Tennessee Air Line; but that the agent of said line should have reported to his initial line, which was a member of the Association, and left the remedy to said initial line.

"In regard to the action of the Western & Atlantic Railroad and the General Commissioner in this case, the committee are of the opinion that the rates to Atlanta having been cut by the Virginia & Tennessee Air Line, and there being no doubt of this fact, on account of the admission of the General Agent, the General Commissioner was justified by the rules of the Association in requiring the Western & Atlantic Railroad to enforce Rule 13 against them, as to charging local rates on shipments over that line, and demanding prepayment of charges before shipment.

"We are of the opinion that it was within the discretion of the General Commissioner to require the enforcement of the rule both as to freight and passengers. But as it appears by the testimony before the committee, that the demand as to the latter was ultimately waived by all parties, the committee must conclude that the Western & Atlantic Railroad had good and sufficient reasons for declining to enforce that portion of Rule 13, as required by the General Commissioner.

"2d. In regard to the Atlantic Coast Line: It was in evidence before the committee that the General Freight Agent of the Old Dominion Steamship Company had given permission to the agent of the Atlantic Coast Line to cut the rates on a certain day, and had withdrawn it within three days. The committee were not able, however, to ascertain whether any shipments at reduced rates had been actually made under this permission, but it appears that the reductions upon which the General Commissioner predicted his action in ordering the Charlotte, Columbia & Augusta and Georgia railroads to enforce Rule 13 against them were not those made under this permission, but the reductions were made prior to such permission.

"The information upon which the General Commissioner acted was, though satisfactory to him, of such a confidential

nature that he could not disclose it even to the principal officers of the Atlantic Coast Line. While the committee are of the opinion that the General Commissioner might find in the rules of the Association justification for enforcing its rules upon such information, they must, at the same time, express the opinion that, as a matter of common justice, the General Commissioner should not enforce penalties upon any member of this Association, unless he is authorized to disclose to the principal officers of the roads charged with violations of the rules of the Association, the information upon which he acted, and thus enable them either to disprove the charge, or if the charge is found to be true, dismiss the agent who committed the offense.

"Bd. As to the irregularities by the Piedmont Air Line: The evidence before the committee shows that the irregularities consisted of certain shipments of molasses from Richmond at rates not made by the Rate Committee. But as these shipments were made on open rates the committee are of the opinion that such irregularities were the result of a misapprehension on the part of the General Freight Agent of the Richmond & Danville Railroad, and not from any intention to violate the rules of the Association.

"The committee have specially reported on these cases because they are mentioned in the circular of the General Commissioner, as the causes which induced him to authorize lines which had maintained rates to get their proportion of business, and because evidence was introduced before the committee bearing especially on these cases.

"The committee, however, are of the opinion that the general scope of the testimony before them indicates that in fact very few of the lines in the Association have fully and strictly maintained rates at all times, and that, as a rule, none of the members of the Association have been willing to rely solely upon the operations of the Association to protect them in their business. The committee regard this fact as the cause underlying the present troubles in which we are involved, and which, if not removed, will in the future, as it has in the past, operate as a barrier to the successful operation of the Association.

"The remedy, therefore, lies primarily in the removal of this cause, by such changes in the rules and agreements of the Association as will enable all parties interested to unite with a common purpose, to protect the common interests of the transportation companies of the country. In an organization of this character, where there is no executive power, except that which when exercised affects injuriously the interests of the innocent almost as much as that of the guilty, there is an absolute necessity for unanimity of action and mutual confidence between all its members. This cannot be had unless all the members of the Association are deprived of the right to assert that they are treated unjustly by the action of the Association. It cannot be expected that so many adverse and antagonistic interests can be reconciled by the parties themselves, and it is, therefore, necessary that the settlement of all questions affecting divisions of business should be submitted to arbitration, and that all should agree to abide by the decision of the arbitrators. Until this is done, the committee submit that, in the present condition of affairs, they see no remedy for the troubles in which we are involved, which promises any more success in the future than in the past; and, therefore, beg leave to recommend that the settlement of these troubles should be made on this basis.

"The committee are of the opinion that no satisfactory or permanent settlement can be made until a division of business is agreed to under the rules of the Association, by the Virginia & Tennessee Air Line, not only at Atlanta, but at Rome, Selma and Montgomery, and that when the division is so made, all questions of violations of the rules of the Association, whether on account of reduction of rates or from other causes, shall be settled under the rules of the Association, and that in no case shall the aggrieved parties take the remedy into their own hands, and that each and every member of the Association should pledge himself to carry out strictly the orders of this Association or the General Commissioner, either now in force or to be issued at any future time with a view to securing a settlement on the above basis, and of maintaining it when arrived at.

"E. W. COLE,
"JOHN B. PECK,
"L. P. GRANT,
"E. B. STAHLMAN.

"I approve the above report, except that in my opinion a permanent settlement must involve, also, a division of business at Dalton and Chattanooga, and some understanding as to business beyond Chattanooga, either a division or agreement of rates, and also that the principle shall be recognized that water lines may give insured bills of lading, but no water differences of rates at competitive points.

"E. P. ALEXANDER."

Mr. Stahlman asked of the convention consent for him to add in writing his approval of the addition made by General Alexander. The consent was granted, and Mr. Stahlman added as follows:

"Inasmuch as the question of water differences claimed by the several lines interested has in the past produced complications and a disturbance of rates, I most heartily concur in the suggestions of General Alexander, and would recommend that all water lines working to and from the East be authorized and required to issue insured bills of lading, to cover marine risk from port to port, so as to place such lines in this respect on an equal footing with 'all-rail lines,' and that all lines be required to maintain equal rates.

"E. B. STAHLMAN."

In course of discussion on the report, Mr. Ogden stated that the Virginia & Tennessee Air Line had agreed at a meeting held in Augusta to make divisions of business at Selma, Montgomery, Rome, Dalton and Chattanooga.

Mr. Pinckney stated that the Virginia & Tennessee Air Line would, on instructions from the General Commissioner, restore and maintain rates.

The report of the majority of the committee was amended by the addition of Gen. Alexander's minority report and adopted.

It was voted unanimously that rates to all points be restored at all points as rapidly as possible—not later than April 15.

Mr. Bridgers gave notice that circumstances, affecting locally his roads, had arisen, which might cause him to be obliged to withdraw from the Association at the expiration of the present term.

The convention adjourned to meet on the second Wednesday (13th day) of August, 1879, at the Greenbrier White Sulphur Springs, Virginia, at 12 o'clock noon.

After adjournment it was ascertained that owing to engagements by some lines, rates could not be restored to some points before the 21st. To most points rates were restored fully, after sailing of steamers of the 12th.

Per Diem Charges for Car Service.

[Paper prepared for the Chicago Convention of the Car Accountants' Association, by Mr. J. T. Rigney, of the Baltimore & Ohio Railroad.]

Custom makes laws, and when a law of custom has been the rule for government for a period of years, it is thought by some that it ought to be permanent. Necessity may

make such a law good so long as no better can be provided, but when flaws are discovered in it, and a better one can be had, it is the duty of legislation to make a change.

Miles run having been for some years the law for regulating pay for the use of cars, some persons think that miles reported must necessarily always be the law for settlement. Not so thinking, I, at our last meeting, offered some propositions looking to a change in the customary law for payment for use of cars.

Believing that the practical operation of a mileage pay is not a good one (whatever the theory may be) and that a better law can and ought to be established, whereby car owners will receive greater protection from abuse to their cars than mileage can give, and more justly receive compensation for them, and that every idea previously advanced was insufficient, my propositions were offered as being ample for these purposes.

Since that time, I have seen nothing that gives me cause to change my views. To the contrary, my opinion is strengthened, not only from long contemplation of the matter, but also from many errors seen since then in mileage reports, showing how easy it is to do injustice unintentionally, by giving credit to one road for cars belonging to another, and premeditatedly by withholding just dues—and I am more fully convinced that a decided change in the mode of accounting car service will be advantageous (not to some roads only, but to all), if for no other consideration than the revenue from the use of cars. Under this conviction, with your permission, I will inflict upon you some remarks in the matter.

One principal object railroad managers have in permitting their cars to go off their line to other roads is to get economy in handling and movement of freight. Unless these are obtained at the smallest possible cost, railroad owners do not derive the full benefits they ought to have from the arrangement. Whatever plan, then, is used should be one to reduce rather than increase the cost to have it effectually carried out.

In some instances, roads that have freights offered them for distant points off their line do not immediately send them forward, because either they have no cars from that distant point, or are unwilling to let their own cars go from home. In either case, freights must wait until a supply of cars can be obtained. If in this time depreciation in value of the commodity takes place, the owner of it is at a loss simply (and for no other reason) because shipping road will not take the chances of delay to its cars away from home. There must be a remedy for this; a remedy that will provide at all times cars sufficient to meet all demands, and also secure owners against delay to their cars and prevent loss therefrom; an arrangement that will produce quick handling and prompt forwarding, and compensate; an arrangement looking as well to the benefit of the people as to the interests of the roads.

There are three modes for use of cars: a pay for miles run, a pay per day, and free use. The last being an absurdity, I give it no thought. Of the mileage, there are two periods of reporting now in use, a daily and a monthly one. In considering these, I will endeavor to contrast them with each other slightly, and with a pay per day, in order that, if possible, a proper conclusion as to their merits and economy may be reached.

The daily plan of reporting cars and mileage has been, at every meeting we have had, presented to us with all its beauties and benefits, in glowing colors, without any detraction whatever, except the insignificant one of leaving us in ignorance of the cost of working it. This item of cost is to me a very important one—without taking into consideration any other feature of the plan—and it is necessary for me to know what it would be, in order to arrive at a just conclusion as to its economy. Opinions have been plenty. Facts with figures are now necessary.

I assume that each system is to be worked thoroughly in all its parts—shirking nothing; that all information relating to movements, etc., as presented in each plan will be put upon record ready for reference, if needed.

The daily plan may be interesting to look at, and excite wonder to the uninitiated how so much confusion could be placed on record and be understood. In contrast to this elaborate idea I present a per diem plan, which will have no increased labor or cost, as being accurate in all its parts and complete in its simplicity.

After the work is done necessary to have record of cars in all their wanderings under a daily individual report, there is no evidence of its correctness except the report itself, which is made by the user of the car. There is no way by which an owner can know how his cars are used on other roads, and he must accept the reports as they are made.

In a daily pay an owner will have a check in his own hand that will tell him positively how much is due him and how much he owes every day. He will not have to depend upon reports from others. He cannot be made to pay for one car more than he receives, nor to receive pay for one car less than he delivers.

If a compensating benefit cannot be derived greater than the cost of trying a plan to procure knowledge of a matter open to many irregularities, it would be folly to enter into it simply for the pleasure of doing it.

To my knowledge, none have yet been willing to show the cost of working the daily individual system of reports and records. As this information has not been given me, I must condemn it myself.

If one-half the cars off our line (1,500) moved every day, one, two and three records per car would have to be made to record them. If only one-half of the foreign cars moved every day, at least 1,500 records would have to be made, provided many cars were reported together. If but few cars are reported, more records will be required; and when one car only is to be reported, seven records are to be made. Is it probable that several hundred records could be added to the work of each of several clerks, when time is already employed to keep up current work, without great addition of work?

From all this labor, all these exchange of reports, what is the profit? Nothing, absolutely nothing. Our cars are none the less idle in consequence of reports being more frequent, and we are not profited in more employment for them.

It won't do for railroads to add to the cost for a service merely because it looks pretty, but is unproductive of profit.

In contrast, daily rental will be without these reports and labor, and will not cost one additional dollar.

Under the mileage pay, by whatever plan it may be worked, an account must be kept with every road reporting mileage. Under a fixed pay, the number of accounts will be limited to the number of a road's immediate connection, so that, if the same road that now has to keep 150 accounts for use of cars, has 25 connections, it would have to keep only one-sixth part of the present number.

After all reports are made and the additional work is collated (without counting the cost) under the daily individual plan, what is the worth of the idea? Has it any real value as an economy or profit? Let us consider it. Its economy I have shown in the work necessary to be done. Its profit after the work is done I will also try to arrive at.

Does it bring about a prompt handling and hasten the movements of cars? I notice a car on an individual road 32

days, of which 18 were idle days. A car on another individual road 56 days was idle 49 of them.

Ask, if these movements were hastened by the reports, where is the profit in them as a coercive measure? Did they do better than a monthly report? Under such a state of affairs the report has no value for a compulsory movement of cars.

A fixed pay has, in this particular, a two-fold value. First, that every car has its equivalent every day, work or play, to its owner; and, second, however small that equivalent may be, a manager will, in his bounden duty, try to save as many per diems as possible by getting the car off his line at the earliest moment. With this self-interest power pushing him all the time, it is not too much to say that per diem pay will accelerate the handling of cars.

Is a daily mileage report proof of its correctness? A manager, having a car in use as a warehouse, or for some other reason, might think it more profitable to him to report a movement than to discharge the car. He can do this every few days, varying his distances, as long as he comes within a decent time of reports. Again, a car may be reported for a distance one day, and some days subsequent again reported. In the meantime it may run four times the distance reported, moving the entire time it stood still on paper. Again, a car may be moved and not be reported. These are all possibilities within the pleasure of persons to make reports as they choose, and, being so, are conclusive that mileage reports have no value whatever as positive evidence of their own truthfulness.

Fixed pay leaves nothing problematical or possible to a reporter's inclinations but the truth. It is a matter of fact known to the contracting parties, and establishes its correctness beyond cavil.

Mileage pay does not give equivalents, because the report rendered by one road must be accepted by the receiver, he having no option in the matter. Railroad managers in agreeing to this put themselves in like position as would a man who would make a contract with another, and give to the other the power to do, or not to do, what he might choose.

Per diem is not a one-sided affair. It has a value agreement mutual to both parties, each of whom has positive knowledge in his possession, and debit and credit are truthfully determined. If debtor and creditor both know daily how their accounts stand from daily pay there is value in the arrangement far above a one-sided transaction of any kind.

Under the mileage pay, I pick up again the car that was doing local for 32 days. In the 14 active days 1,193 miles were reported, paying \$8.94. For each one of the active days, the borrower paid 64 cents; but the owner received only 28 cents for the 32 days. Is it unreasonable to say that an owner ought to be paid as much for his car as it is worth to borrower? or, if a car is worth 64 cents to a borrower, is it not worth 64 cents a day to its owner? Suppose per diem had been the rule at 64 cents. If the borrower had been obliged to keep the car for 14 active days, he would have paid no more for it; and the owner would have received no less; but the owner would have (what he was entitled to) received the additional benefit of the earnings of one car for 18 days.

Under the mileage pay, a car making a round trip of 200 miles in three days earns \$1.50—equal to 50 cents per day—which the borrower pays, say willingly. If you put the same price per day on it, the manager will be unwilling to pay for more days than he is necessitated. He will exert himself to get rid of the car in two days, and save one-third of the hire. Per diem, however, will do better than this for him. Through it he will get back on the day he delivers the car to another the sum he paid when he received it, and, if the transaction is completed in two days, he will save 100 per cent. In other words, he will have the use of the car for nothing. If the road is a connecting link over which the car passes without stopping, what is paid at one end to receive the car will be received back at the other end when delivered, and, if the journey is made within two days, there will be no cost for car hire.

Now take a terminal road 300 miles long; mileage for a round trip is \$5.40; make the average time 7 days and the cost is 77 cents per day. At the same rate per day under the per diem pay, the manager will save every day he can. If he can get rid of the car in five days (which he can), he will save 154 cents, to which will be added 77 cents on the day of redelivery, reducing pay to four days (\$3.08) instead of \$5.40 for seven days, a saving of nearly eight hundred and fifty dollars a year on one car per day in money to the borrower; and to the car owner, besides receiving full compensation for his car, the increase of 25 per cent. to his freight capacity.

Throw together the entire freight equipment of the country and add to it 25 per cent. of its capacity—derived without the cost of one dollar—and calculate the immensity of the revenue it would produce.

These advantages will be obtained and this saving be made through the energetic action of their managers. They will not be put to the cost of one dollar.

Whether a per diem pay is desirable or not is not to be determined by the opinion of the person to whom the question is put. It may be a good thing and yet not desired by certain persons.

That it can be worked successfully there is no doubt—the only requirement being the same hired value to all cars on all roads, and their circulation to any and every territory.

Then when freight is offered, load it promptly and send it forward.

These two points—equal value and circulation everywhere—being agreed upon, it is only necessary to fix the base for working it. The base once fixed remains forever. Every road will establish its own base with its connections and have a fair start. On the day set to begin the plan, each road will ascertain how many cars are on its line received from each connection; and how many of its own cars, and foreign cars for which it is responsible, it has charged to each connection. The difference between the two will be the base for payment. To this base must be added all cars delivered, and subtracted all cars received on the first day. The difference between the two will be the number to be paid for on the first day, and this number will be the base for the second day. This operation being done, every day, the working is complete. For example, on the day fixed A has charged to B 200 cars belonging to A, and others of his connections, not received from B, and he has received from B 100 of B's cars and others. The difference between the two gives the base 100 cars in favor of A. On the first day A delivers 25 cars to B, making due him 125; but he receives from B 50; this leaves 75 cars to be for by B to A on the first day. On the second day A delivers 50 and receives 50—this leaves to be paid for 75 cars on the second day. On the third day A delivers 50 and receives 25 cars. On this day B has to pay for 100 cars, and so on. A plain, correct operation of addition and subtraction.

I illustrate the operation more fully thus: On May 1, if the business was to be then commenced, I would know how many foreign cars were on my line, and how many of my own cars were off the line at 12:01 a. m. Say the account stood thus with one connection—the M. & C.

I have delivered and charged to M. & C.: B. & O., 300

g. remove to Florida, to take charge of the construction of
f new railroad there.



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EDITORIAL ANNOUNCEMENTS.

PASSES.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

CO-OPERATION AND ARBITRATION IN TRANSPORTATION.

The action of the Joint Executive Committee at its meeting last week, the official report of which we publish in this number, was extremely gratifying to those who hope to see a settlement of the through freight question on a stable basis and terms generally satisfactory. The steps then taken were the rational sequence of the action of the presidents of the trunk lines at their recent meeting, and, as Mr. Fink said in his address to the members of the committee, stating the objects of the meeting, are "for the purpose of carrying out and perfecting" the plan adopted at the Chicago meeting last December. That meeting's purposes were unexceptionable; its failure was in providing means for carrying them out—a task not to be completed by a few hours' deliberation by men who have not before given it special attention. At all events, the action was taken too late to cover the winter traffic, when it could be made most advantageous. Now work is begun early, and steps are taken slowly and deliberately, and there is reason to hope that a plan will be perfected, apportionments made and methods for conducting the business matured which all the lines concerned will consent to and indorse, so that the fall and winter business at least may be carried at regular and steady rates, which will fully cover the cost of transportation and enable the roads to obtain some part of the interest on their investment from the vast through traffic from the West, which for a very large part of the time during the past four years has contributed absolutely nothing toward the remuneration of stock and bondholders.

The action taken at this meeting is that which was recommended by the Trunk Line Executive Committee in their report of March 6, and indorsed by the

presidents of the trunk lines recently. The Joint Executive Committee which now indorses it acts for all the Western and Eastern roads concerned, but as not nearly all the Western roads had an officer of their own on the Joint Committee as it met last week, it is not so certain that all of them will immediately, fully and unreservedly subscribe to its action as that the Eastern roads and the lines controlled by them will do so. This is one of the difficulties in the way of co-operation in the conduct of the east-bound freight. It originates at so many places and on so many different roads. The process of negotiation must be gone through with many times and by many parties, and with the best will is likely to last for a considerable time. And, if it is left absolutely and permanently to the various companies, it may never come to a conclusion, as was seen last winter with the Chicago traffic. The rules reported by the Trunk Line Executive Committee and last week adopted by the Joint Committee are, however, in great part the work of the Western roads, which were largely represented at the Chicago meeting in December, and which adopted rules which form the chief part of those adopted by the Joint Committee. The additions are chiefly or solely modes of effecting the purposes set forth in the other rules.

The provision of a permanent Board of Arbitration is perhaps the chief of these. It will stand ready to settle any difference which the parties to it cannot settle for themselves. It obviates the necessity of agreeing upon an arbitrator, which sometimes has been found to be as difficult as agreeing upon the terms themselves of the settlement to be arbitrated. The Joint Committee made a very creditable selection of persons as arbitrators—men of wide reputation, of character and ability, and known as students of economic questions. Mr. Charles Francis Adams, Jr., needs no introduction to the public or the railroad world, and his duties as Railroad Commissioner of Massachusetts has frequently compelled him to act as arbitrator between railroad companies, or between a railroad company and some individual or public interest, for a long time. Mr. David A. Wells has given most of his life to economical investigations, and has the peculiar knowledge and ability needed to enable one to understand the traffic questions likely to come before the arbitrators. Mr. John A. Wright is not so widely known, and has not been so much of a public man, but he is probably much more familiar with purely traffic questions than either of the others—is, indeed, exceptionally well informed in such matters. He is best known in Philadelphia and in connection with the Pennsylvania Railroad, though we believe that he was never in the actual service of that road, except, perhaps, in some financial negotiations. He was a member of the Investigating Committee that published the remarkable and able report on that company a few years ago, which report is said to have been largely from his hand. Latterly he has been in the service of the Erie, as an aid to President Jewett.

It is possible that some of the persons chosen may decline; they have not yet been officially notified of their appointment; but it is gratifying to see men of such quality named, whose service would be a pledge of intelligent and unprejudiced judgments, and whose reputation would throw credit on the whole scheme. The public, we know, is not inclined to favor such co-operation of the railroads. It looks with suspicion upon the common action of corporations that have heretofore been hostile to each other. It is proper, then, to take special pains to meet this feeling; to take action in such a way and through such men that the public may feel that it has some assurance of fair dealing. In reality the community in general does not object to the attainable purposes of the railroads—the maintenance of through rates which will always cover the expenses and something more. It may fear that if the companies had the power they would make the rates unduly high. This is an idle fear, it is true, because through rates are limited by circumstances which would be beyond the control of any combination or company, though it should control or own the whole railroad system; but that is not a reason for ignoring this feeling. With the assurance that through rates will always be moderate and reasonable, as they always must be if the railroads continue to carry through traffic, the great body of business men will welcome any action which will tend to reduce the fluctuations of such rates to a minimum, and make it absolutely certain that they will be the same to all shippers without exception.

Railroad Earnings in March.

March earnings are reported in our table from 29 different railroads with 17,183 miles of road. They have earned this year \$8,552,216, which is 8.5 per cent. more than they earned in March last year, their mileage being 4.3 per cent. greater, and their average earnings

per mile of road have increased from \$478 to \$498, or 4.2 per cent. Of the 29 roads, 17 show an increase and 12 a decrease in the total earnings, but only 14 an increase and 15 a decrease in earnings per mile of road worked. Those which have larger total earnings but smaller earnings per mile of road are the Central Pacific, the Chicago & Northwestern and the Illinois lines of the Illinois Central. The Chicago, Milwaukee & St. Paul, in spite of an addition of one-fourth to its mileage, shows a small decrease (4½ per cent.) in its total earnings. The "spring-wheat roads" do not for this month show much decrease in aggregate earnings—only \$48,505 from the total of \$2,073,813 in 1878, or 2½ per cent., but meanwhile their length has increased from 4,508 to 4,957 miles, and the addition of 10 per cent. to the mileage brings down the average earnings per mile of road (for five roads) from \$461 to \$418, or 9 per cent. Nearly two-thirds of the total decrease, however, is on one road, and on that one, too, on which four-fifths of the increase of mileage has been. The others show but a trifling falling-off either in total earnings or in earnings per mile of road, and have done better than in several years previous to 1878.

The roads reporting do not by any means represent the average of the country. Of their 17,183 miles, very nearly 10,000 miles are west of the Mississippi, and some 4,800 miles are west of the Missouri or the longitude of Kansas City, and only 1,088 miles are as far east as Pennsylvania, while no earnings are reported for any road east of Philadelphia.

There are six roads in the table whose business is largely or chiefly the carrying of farm produce to Chicago. These have an aggregate length of 6,024 miles, which is about 8 per cent. more than last year. Their aggregate earnings, however, fell off slightly—not quite one per cent.

Five of the roads, with an aggregate length of 1,786 miles (the same last year as this), are carriers of produce to St. Louis.

All but one of these show an increase in earnings, the aggregate increase being at the rate of 4½ per cent.

The better to compare the progress of the roads, we have compiled the following table of earnings in March per mile of road for six years:

March Earnings per Mile of Road for Six Years.

	1874.	1875.	1876.	1877.	1878.	1879.
Atch., Top. & Santa Fe.....	\$205	\$254	\$206	\$376	\$595	\$595
Bur. C. E. & North.....	229	264	199	285	258	258
Cairo & St. Louis.....	135	133	142	136	134	134
Central Pacific.....	\$700	879	901	750	594	591
Chicago & Alton.....	554	590	547	510	527	508
Chicago, Mil. & St. Paul.	412	350	405	334	400	357
Cleve., Mt. V. & Del.....			188	187	194	190
Hannibal & St. Jo.....	617	469	553	531	549	651
Ill. Cen. (in Ill.).....	624	637	590	514	462	467
Ill. Cen. (in Iowa).....	295	363	405	284	332	311
Ind., Bloom. & West.....	452	305	301	264	461	380
Int. & Gr. North.....	209	231	208	217	194	237
Kansas Pac.....	323	336	286	342	400	507
Mo., Kan. & Tex.....	334	297	313	315	301	286
Mobile & Ohio.....	331	247	284	186	315	310
Nash., Chat. & St. L.....		308	428	400	410	428
Phila. & Erie.....		876	858	770	655	739
St. L., A. & T. H., Belle-						
ville Line.....	626	605	595	612	548	609
St. L., I. Mt. & So.....	345	403	437	512	502	515
St. L., Kan. C. & N.....		484	544	527	580	604
St. L. & S. E.....	301	258	240	230	263	271
T. P. & Warsaw.....	414	307	433	309	459	385
Wabash.....			502	520	583	491

Here we have the March earnings per mile of road of 23 roads for 1876, 1877, 1878 and 1879, of 21 of them for 1875, and of 15 for 1874. This enables us to see what the course of traffic has been and whether the earnings in either or both of the past two years have been exceptional. The earnings per mile, however, are often greatly reduced by the addition of new mileage of comparatively unproductive road to the old, an example of which is seen in the Central Pacific, the earnings of whose old road have been tolerably stable, while the Southern Pacific, which it works, has greatly increased its mileage while adding very little to its total earnings. The Chicago, Milwaukee & St. Paul, whose mileage had been nearly stationary previous to this year, has been increased one-fourth, mostly by new road opened last year in districts which are as yet very thinly peopled, which goes far to account for the reduction of one-third in its earnings per mile of road. Something of the same effect is seen this year on the Illinois lines of the Illinois Central. On the other hand, the Atchison, Topeka & Santa Fe has gone on increasing its mileage and its earnings per mile at the same time in the most unprecedented way, though its new road has all been on the very borders of civilization.

But of the 23 roads whose March earnings per mile are given for the past four years, 10 have earnings this year larger than in the corresponding month of 1878, 15 larger than in 1877, and 12 larger than in 1876; of the 21 whose earnings are given in 1875 and 1879, 12 had the larger earnings this year; and of the 15 reporting for 1874, five have larger earnings this year. This shows March to have been favorable this year when compared with the average of previous years;

the 29 roads in our table show an average increase of 4.2 per cent. in earnings per mile over last year. There is not, however, any very great change in the average earnings—nothing to indicate any general revival of business. Six of the roads in the list (the Atchison, Topeka & Santa Fe, the Hannibal & St. Joseph, the International & Great Northern, the Kansas Pacific, the St. Louis, Iron Mountain & Southern and the St. Louis, Kansas City & Northern) show larger earnings than in the corresponding month of any previous year here reported, and one, the Nashville, Chattanooga & St. Louis, just as large. On the other hand, five roads (the Central Pacific, the Chicago & Alton, the Illinois lines of the Illinois Central, the Missouri, Kansas & Texas, and the Wabash) show smaller earnings per mile in 1879 than in any previous year in the table. There is no portion of the country of which it can be said, from the facts contained in this table, that it shows a general tendency (for the whole period) either upward or downward in the transportation business, unless it may be Kansas, whose two great roads show a marked tendency to improve; but the Missouri, Kansas & Texas, which has a considerable mileage in Kansas, on the other hand, grows worse rather than better, and there is a very large mileage in the state from which there are no reports. But that is true everywhere. There are not enough roads reporting in any one district to give a safe clue to the general condition of business there.

For the first quarter of the year, ending with March, the table has reports from 30 railroads with 18,889 miles of road, about 1,750 miles of which are in Canada. These lines, with 3.9 per cent. more road, had 2.7 per cent. greater earnings than in the corresponding quarter of 1878, and their earnings per mile decreased from \$1,424 to \$1,408, or 1.1 per cent. Of the 30 roads, 15 show an increase and 15 a decrease in total earnings, 14 an increase and 16 a decrease in earnings per mile of road. The largest increases in earnings per mile are 66.3 per cent. on the Atchison, Topeka & Santa Fe, 28.2 on the Galveston, Houston & Henderson, 24 per cent. on the International & Great Northern, 23.6 per cent. on the Kansas Pacific, 51.8 on the Philadelphia & Reading, 18.9 on the Belleville Line, and 46.4 on the new Scioto Valley. The largest decreases are 27.1 per cent. on the Burlington, Cedar Rapids & Northern, 33.3 on the Chicago, Milwaukee & St. Paul, 20.3 on the Iowa lines of the Illinois Central, and 21.1 on the Toledo, Peoria & Warsaw. The smallest earnings per mile for the quarter are \$354 on the Cairo & St. Louis and \$530 on the Cleveland, Mount Vernon & Delaware, and the largest are \$3,505 on the Philadelphia & Reading and \$2,619 on the Galveston, Houston & Henderson. The largest are ten times as great as the smallest.

In this table there are reports from three roads that carry trunk line traffic and may be supposed to reflect, to some extent, the condition of trunk-line business. These three are the Grand Trunk, the Great Western, and the Philadelphia & Erie. The two Canada roads show a decrease (5 and 12.7 per cent.), the Philadelphia & Erie an increase (12.4 per cent.). The through traffic we know to have been immense, larger in both directions than last year, and the rates have been probably somewhat better this year.

A Standard Form for State Railroad Reports.

We call particular attention to the report in this number of the meeting of the committee of railroad commissioners and accountants held in New York last week to submit to a convention of the railroad commissioners of the several states next summer a scheme for uniform reports and accounts to be rendered in every state where reports are required by law. This is a matter that concerns the railroad companies very closely. It is almost sure to result in action which will require a very large number of them to keep certain records and render certain information which a great many of them do not now publish at all, and some of them do not record even for their own private information. The commissioners have taken an enlightened course in their proceedings so far. They designated certain railroad accountants to act with the committee in preparing the schedule, and they have asked for information and suggestions from a great many more. And several railroad officers have taken a great interest in the matter, and have presented quite in detail their idea of what ought to be required in the report. It is noticeable, however, that those who take such an interest belong almost entirely to the class who "want to know." The people who do not care to know and who especially do not want anybody else to know, have been conspicuous by their absence and their silence. But we shall be mistaken if they do not make a great deal of noise after the work is all done and the schedule put into force, if it is made

as it now seems likely to be made. We give fair warning of this, for the work is not yet done, the committee report not even being completed, to say nothing of its acceptance by the commissioners' convention. Those who have any objections or suggestions to offer should present them now, or else hereafter hold their peace.

We may say here that most of the new requirements made have been at the suggestion and request of railroad men. This is true of car mileage, of separate statements of the traffic in each direction, and of the method of distinguishing through and local earnings.

Unfortunately, the schedule which we print this week is not quite complete—complete so far as it is absolutely adopted, but it should be supplemented by a scheme for presenting the items of working expenses which was presented by Mr. George E. Towne, formerly Auditor of the Boston, Clinton & Fitchburg, and which was received with a good deal of favor, and concerning which expressions of opinion will be asked before the final report of the committee is made. This, together with other papers submitted by railroad accountants at the meeting next week, we expect to present shortly.

We hope there will be a full discussion of this subject now. Those who have ideas on the subject of railroad accounts and reports will hardly have another opportunity so favorable for securing a hearing, making an impression and affecting action. Very likely in a few months a schedule will be adopted which will become the law in ten or twelve of the most important states of the Union. It will then be very difficult to change. All companies which have road in more than one state will welcome uniformity in the year and the form, even if they detest any state report. Now, on the one hand, it is desirable to make the report contain all the information needed, and on the other to avoid unnecessary and impracticable requirements. We are aware that there is the widest possible difference of opinion as to what is necessary and practicable. But we suggest that when objection is made to a requirement as causing undue labor and expense, a statement be made as to how great the labor and expense will be. There is such a thing as paying too high a price for information, of course, but one does not prove that it is too high by saying so, and sometimes it appears too high only because the appraiser puts too low a value on the information. We are in the position of those who use the statistics and do not have to pay for keeping them, and we are inclined to ask for all that we can get; and we know that such figures as bulk of traffic in the different directions, car mileage and receipts from through and local traffic have a very great value for many purposes. There are a few companies that keep and publish them, and some of these we know place a great value on them. There are others that keep, but do not publish them, and some if not all of these, we imagine, would not particularly object to making them known, provided their competitors had to publish the same information. This is just what they will have to do if the purpose of the railroad commissioners is effected, as all the New England roads, New York, Pennsylvania and Virginia, and all the states further west except Indiana as far as Kansas and Nebraska, are included. The only important states omitted (with which roads north of the Ohio have any considerable competition) are New Jersey and Maryland. In some of these states, however, the introduction of a new form of report will require legislation.

The Southwestern War.

The efforts made to prevent the extension of the contest of the lines of the late Southwestern Railway Association from extending to the roads further east have resulted in an arrangement which bids fair to confine the contest to its proper limits, and, so far as through freight westward is concerned, put the Chicago and St. Louis roads on a pretty equal footing. When the war broke out, Chicago had the advantage of its lower rates from New York; when the Wabash joined the St. Louis roads, they got the advantage of the difference between Chicago rates and Toledo rates. But the Wabash had agreed to maintain rates to St. Louis and accept a certain proportion of the traffic to that place. The settlement is made by giving bills of lading for all traffic consigned to Missouri River points by any line only to that point of the line where it crosses the Mississippi River—St. Louis, Louisiana, Hannibal, Quincy, Burlington or Keokuk—and charging the full rate—that is, the St. Louis rate—for this distance, leaving the lines west of the Mississippi to charge what they please while they are fighting each other. The effect of this is to prevent making rates from the east to Missouri River points lower than to St. Louis, as the Chicago roads could have made them (and have made them) by adding a badly-cut rate to the Chicago rate; and so much

the more from making them lower than the Chicago rate, as the Wabash and the St. Louis roads could do (and did) by adding a badly-cut rate to the Toledo rate. The several roads are forced, as it were, to accept a somewhat higher rate than they would like to make, in order that it may remain possible for all of the competitors to continue to do business. They may now carry for half of the cost, but not quite for nothing.

Under the arrangement made by the Wabash, making Chicago rates to St. Louis, not only did the traffic tend to go by way of St. Louis, but pretty much all that went by way of St. Louis went by way of the Wabash road. It alone made the reduction to St. Louis on Missouri River traffic, the other roads east of St. Louis not desiring to enter the fight. They are assured their share of the traffic in any event, and it does not much matter if they carry none in April, provided they get their share in June or September; and if they have any ill will against their competitor from Toledo, they may prefer to see it carry its share at half rates, while they get full rates for their own share. The amount of the traffic is not great enough to be felt in the loads of trains. On the average, there is said to be about 100 tons a day dispatched from New York to the four Missouri River points, and this goes by a great many routes, so that no one of the five lines into St. Louis or of the five into Chicago gets any very large part of it under any ordinary circumstances. There is no sufficient reason why this little traffic should set all the lines east of the Mississippi by the ears. Yet the tendency was in that direction, and at one time it seemed quite possible that the already low rates would be reduced materially on twenty or thirty times the traffic from the east to Missouri River points simply because of a conflict between roads west of Chicago and St. Louis in which the roads east of those cities, with one exception, took no interest.

The arrangement made does not suit either the Chicago or the St. Louis roads. It suits the latter, however, better than the original condition of things, which allowed the Chicago roads to make rates to Kansas City lower than those which the Missouri roads had to pay to get it to St. Louis; and it suits the Chicago roads better than the condition made by the Wabash, which compelled them to make the same rate over their 490 miles as the St. Louis roads over their 275 in order to make the rates the same by both routes. Substantially it puts this portion of the traffic (and it is so small a portion that there never should have been any question about it) outside of the contest, where it belongs. There is no conflict about this business. It has long been divided by an agreement which the rupture of the Southwestern Association does not affect, and which the result of the contest will not change. One would suppose that the contending roads would be glad to get a little profit on this little traffic, which, under the agreement, is not really competitive, any more than their local traffic.

The arrangement leaves all the lines engaged in the war free to fight each other to their hearts' content, but forbids their forcing their peaceful neighbors to take part in the war.

As for the conflict proper, there seems to be no new developments. Rates have all along been so low that they could not be made much lower, but we do not hear that traffic has been so greatly stimulated by it as might have been supposed. One would suppose that all the grain in Kansas would hasten to make use of the opportunity for saving something like \$25 a carload, and that lumber would be forwarded to meet the demand for months to come. But the shipments of lumber are said not to have been greatly increased, and the article of which we hear that extraordinary quantities have gone forward is *salt*, of which one might suppose that a few trains could carry enough to supply all the country west of the Missouri.

The Resistance of Railroad Trains.

If this is a subject in which railroad officials generally are interested, others apparently are content to rely upon the data obtained years ago, under conditions that rarely obtain on American roads, such data being contained for the most part in Wood's "Treatise on Railroads," Clark's "Railway Machinery," Colburn's "Locomotive Engineering," and Spon's "Dictionary of Engineering." It seems hardly necessary to offer extended arguments to show that accurate experiments on the resistance of trains would develop facts of the greatest importance to railroad companies, and it will doubtless be more profitable to devote the space allotted to this article to a consideration of the manner in which such experiments should be made.

Recent letters in the *Railroad Gazette* have called attention to a new dynamometer car built at the Pennsylvania Railroad shops, and it is reported that there are several others either in use or in course of construction, on other roads. Possibly the apparatus referred to may be designed in such a manner as to give the most accurate results, but as no detailed accounts have been published, it may not be out

of place to call attention to some features which should be possessed by a good dynamometer car.

The general principles on which dynamometers should be constructed are essentially the same, whether the instrument is to be used for determining the power required to draw a train, haul a cart, turn a shaft, or perform other like operations in which force is exerted. In using the term dynamometer, the qualifying word "transmitting" is to be understood, distinguishing the instrument from the friction brake, in which all the power exerted is absorbed by the apparatus, and no useful effect is realized.

In the transmitting dynamometer, on the other hand, the force required to overcome the resistance to motion and do useful work is all transmitted for that purpose, with the exception of the slight amount absorbed by the friction of the moving parts of the apparatus. In the transmission of the force through the dynamometer, to overcome the resistance some portion of the instrument is made to yield and move, and the force required to produce a given motion of this part having been previously ascertained, the force exerted during an experiment can readily be determined. This yielding portion of the dynamometer is usually a spring, which is either compressed or extended in transmitting the force. Weights and hydraulic and pneumatic cylinders have been substituted for springs, in some instances, but the results of the change

attachment which has proved so serviceable in connection with the use of the friction brake, a dash-pot or controlling cylinder. This will be presently described, and its effect, and the necessity for its use, are well illustrated in fig. 1, in which figure the very irregular line will give some idea of the kind of diagrams ordinarily taken by such traction dynamometers as have been used in this country, and the curved line drawn through the irregular vibrations is supposed to represent their mean, so that the area included between the base-line AB , the two perpendiculars AC , BD and the irregular line of resistance, is the same as that included between AB , AC , BD and the curved line drawn through the vibrations. Now the effect of attaching the dash-pot to the spring is to make the irregular vibrating line approximate to the mean line, the irregular vibrations of the spring being prevented to a considerable extent, while the spring still measures the mean force exerted at every instant.

The movements of the spring during an experiment should be indicated so that they can be read at any instant, and they should also be recorded in the form of a diagram, for future reference. For this purpose, some portion of the spring or its connections should be attached to one end of a pivoted lever, the other end of which moves across a dial, thus indicating and multiplying the movement of the spring. If this lever is connected to a system of levers so arranged that some point in the system moves in a straight line, while

ling cylinder, B , which is filled with oil. The action of this controlling cylinder, or dash-pot, will be evident from the sketch. Whenever the springs are compressed or extended, the piston must move the oil from one end of the cylinder to the other, through the connecting port, the area of which can be regulated by the adjustment of the plug-cock, and thus irregular vibrations of the springs can be prevented. To register the deflections of the springs the short arm of a lever pivoted at D is attached to the springs by a forked connection, so that the lever swings about the point D when the springs are compressed and extended. A parallel motion being fitted to this lever, the end of the long arm moves in a straight line, and a pencil, E , is attached to it, which records the deflection of the springs, magnified in the ratio of the two arms of the lever, upon a piece of moving paper. A light shaft, carrying the wheel G , is connected to the pencil arm in such a way that, as the pencil moves, the wheel G slides across the face of the wheel F , which latter wheel moves with a velocity that bears a constant ratio to the velocity of the car. The two wheels F and G are kept in contact by the action of a light spring on the shaft of wheel F , so that the revolutions made by wheel G , which are recorded by the counter H , depend upon the radial distance of wheel G from the centre of wheel F . When G is at the centre of F , or when no tractive force is applied, F has no ten-

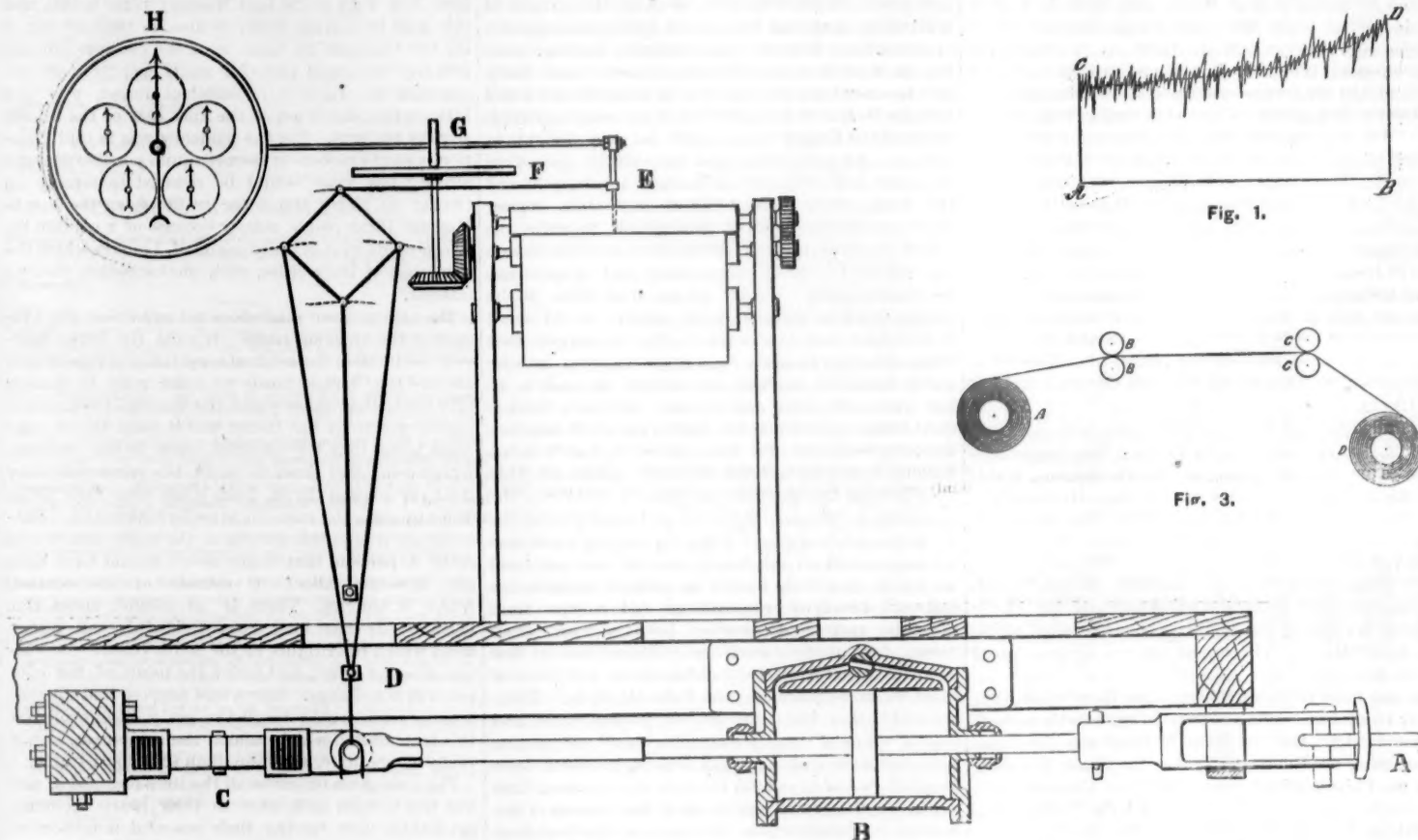


Fig. 2.

have not usually been very satisfactory. If a weight is used a considerable amount of gearing is generally necessary, and in the case of hydraulic and pneumatic cylinders, as they have been used, the friction of the plungers or pistons, and the fluid friction are varying elements which can hardly be determined with accuracy. It would not be impossible to use weights or fluids without experiencing the objections to which attention has just been called, but springs can generally be employed with less complication, and, when carefully constructed, will give results that are perfectly reliable. As it is not intended to present complete specifications for a dynamometer in the present article, it may be sufficient to say, with respect to the spring, that its form should be such as to allow it to be extended or compressed exactly the same amount for each successive equal increment of force or pressure, and the maximum force applied to it should be greatly within the limit at which a permanent set of appreciable amount would take place. Under these circumstances, and with the attachment to be presently described, the quality of the spring would vary but little after long use, and any slight changes that might occur in its elasticity from time to time would immediately be detected by tests with weights, which should be made at frequent intervals.

The tractive force transmitted by the dynamometer to the train with which it is connected is frequently quite variable and irregular in character, so that the spring is subjected to a series of impulsive blows which would keep it in continual vibration, rendering it impossible to read the indications of the instrument with any certainty, even if the scale of pressures that was made by the quiet application of weights could be relied upon under such circumstances. This is one of the most serious troubles that has been met with in the use of traction dynamometers in this country. But as the spring is required to indicate the mean force of traction, or the general effect of all these impulsive blows, it should be provided with an

the point of attachment with the first lever moves in a circular arc, a pencil can be placed at this point, which, if pressed upon a piece of paper that has a rate of motion bearing a fixed ratio to the speed of the car, will trace a line representing the force expended in drawing the train. To determine the amount of work performed in moving the train over a given distance, it is necessary to measure the area included between the line of resistance and base line, or line of no pressure. Even when the diagram is quite regular, this calculation is very laborious, in the case of an extended experiment, and for such diagrams as have been taken with the dynamometers heretofore in use in this country, an accurate measurement of the area in question is generally impossible. For this reason it is best to attach an integrating wheel to the dynamometer to calculate this area mechanically. Where the integrating attachment is in use, it is only necessary to take the reading of a counter from time to time, and the differences between successive readings will be the amounts of work performed in the several intervals.

In the accompanying figures the outlines of such a dynamometer as has been referred to are presented. The sketches are adapted from illustrations and descriptions of the traction dynamometers used by the Royal Agricultural Society of England. Messrs. Eastons and Anderson, the makers of these dynamometers, have a reputation extending far beyond the limits of their own country for the skill and ingenuity which are displayed in their testing apparatus. The reader who desires further information in regard to the traction dynamometers of the Royal Agricultural Society is referred to the *Journal* of that society, Vol. X., new series, page 679; Vol. XI., new series, page 683, and to *Engineering*, XVIII., 22, XXII., 60, 62, 86.

Referring to fig. 2, it will be seen that the tractive force applied to the draw-bar at A is measured by the deflection of the spring C , the rod connecting the draw-bar with the springs being also attached to a piston working in a control-

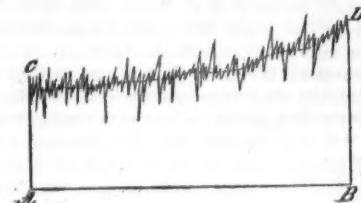


Fig. 1.

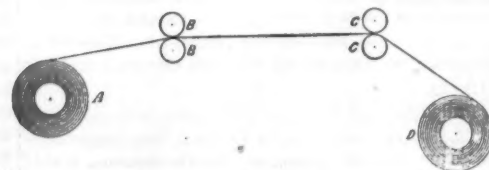


Fig. 3.

lency to turn G , and as G is moved across F , it begins to revolve at a rate of speed depending upon its distance from the centre of F , and the speed with which wheel F revolves, so that it is easy to translate the reading of the counter into foot-pounds of work, or, in other words, to read off at once the area of the diagram that is taken, when the scale of the spring is known.

An end elevation of the feed rollers and paper drums is shown in fig. 3.

One pair of rolls, $C C$, is driven by gearing at a speed bearing a constant ratio to that of the car, drawing the paper over a table through guide rolls, $B B$, thus unwinding the paper from the drum A , and delivering it to the drum D , around which it is wound, the drum being made to revolve, as the paper is delivered to it, by the action of a coiled spring.

The manner of imparting motion to the feed-rolls does not always receive the attention which it deserves, but it is obvious that this is a matter of considerable importance. The motion is ordinarily derived from the truck axle, and as this swings or oscillates both in vertical and horizontal planes, a direct connection with the gearing that drives the paper is not possible. Either a belt must be employed to give the requisite motion, or universal joints and telescoping rods. It is evident, from the theory of the action of a belt, that a fixed velocity-ratio cannot be maintained when the belt connection is used, and this is undoubtedly confirmed by experiment. With universal joints properly arranged, and long connections, the velocity-ratio can be made constant, or at least practically so, the variations from the truth being insignificant. This, however, is a subject that is well understood by those who are familiar with mechanical movements, and its detailed discussion is scarcely called for in the present article, the object being to direct attention to important points, and give general hints for their solution, rather than to furnish working plans.

As the speed at which the train moves when a diagram is

taken must be known to enable the proper corrections to be applied in the final calculations, some attachment should be provided to record this speed on the diagram. Obviously the most convenient and accurate contrivance for this purpose would be an instrument to mark on the diagram the speed at every instant, and the point at which each change of speed occurs. A number of such instruments have been invented, and a convenient form, Wythe's self-recording speed gauge, was illustrated and described in the *Railroad Gazette* for Nov. 28, 1874. It has been usual, where this feature was considered in former dynamometer cars, to indicate on the diagram the mean velocities for short intervals of time, by making marks on the diagram several times a minute, at regular intervals of time, the lengths of the spaces between successive marks showing whether the speed was increasing, decreasing or constant. It is easy to see, however, that this method is very far from correct, since, whenever the speed is accelerated, force is required for acceleration, in addition to that necessary for traction, and when the speed is retarded, the moving mass does work which is not indicated on the diagram, so that only when the speed is constant is the diagram a true measure of the work performed, and it requires correction whenever the speed changes. Of course, to apply the correction, it is necessary to know every change of speed, and this can only be ascertained from a continuous record. This is a matter that has apparently received very little attention from those who have constructed and used dynamometer cars, and even when they have considered the effect of acceleration and retardation they have done it generally in a manner that can scarcely be said to give even a fair approximation to the true correction, and whose whole merit is its great simplicity. The manner referred to consists in observing the mean velocity for a few seconds at the commencement of an experiment, and the same at the end of the run, calling the first observation the initial velocity and the last the final velocity, then assuming that the speed has been uniformly accelerated or retarded during the experiment, according as the final velocity is greater or less than the initial, applying a correction for the force required to accelerate or given out during retardation on this assumption, and assuming that the corrected diagram shows the resistance at the mean speed during the experiment. Of course, if the actual acceleration or retardation during the run is not uniform, as it never is, except in special cases, all these assumptions are unwarranted; and the diagram, which is supposed to be corrected, is far from representing the truth. But if an attempt is made to correct the diagram accurately, applying a correction for every change of speed, the labor involved would be so great as to be practically prohibitory in any extended course of experiments. The obvious remedy for this objection is to make the experiments in such a way that no corrections for acceleration or retardation are required—in other words, to make the experiments at uniform rates of speed. To do this, it will be necessary to place in the cab of the locomotive, conspicuously in view of the runner, some form of speed-recorder which shall indicate the speed of the train at every instant, by the movement of a hand across a dial, or the rise or fall of a liquid in a revolving tube. It may not be possible to run at an absolutely uniform speed for long distances, but with this gauge before him, the runner can certainly make many portions of the trip at uniform rates of speed, and, where he fails to do this will probably be able to increase or reduce the speed at uniform rates.

The manner in which runs have been made in former experiments on the resistance of trains in this country, and the erroneous method of applying the corrections for retardation and acceleration, may possibly account for many of the anomalies that these experiments have exhibited, since it is obviously impossible to determine the true resistance, unless a true diagram is either produced by the dynamometer, or can be made to give truthful results by the application of corrections.

Another mistake which has generally been made in former experiments has been to ignore such an important factor in train resistance as the force of the wind, and its relative influence as dependent upon its direction in relation to that in which the train is moving. The force and direction of the wind may be measured with recording anemometers and wind gauges, similar to those used in making meteorological observations, so that there might be a final settlement of the vexed questions relating to head wind, side, quartering and following winds, and the proportion of wind resistance to be charged to each car in a long train.

A dynamometer car, embodying many of the features that have been detailed in the preceding remarks, has lately been constructed from the designs of M. Regray, Chief Engineer of the Eastern Railroad of France, and is illustrated and described in *Engineering*, XXVI., 290, 307, 329. This apparatus also includes an attachment for determining the power exerted in the locomotive cylinders, by means of an indicator with electrical connections, which takes a diagram in the dynamometer car as often as is desired. It would probably be possible to simplify this indicator attachment somewhat, and arrange it so that the pressure in the locomotive cylinders might be recorded in a continuous diagram, the area of which could be measured mechanically by an integrating device similar to that which has already been described. In fact, the most useful form of dynamometer cars would be one in which all the laborious calculations would be performed by mechanical means, without, however, dispensing with diagrams, which are useful both for future reference and for checking the results obtained by mechanical measurements.

The application of the indicator to the locomotive cylinders, giving the power exerted by the locomotive, in connection with the measurement of the train resistance, thus

showing what proportion of the power is utilized in traction, will evidently furnish results of great value to railroad officials. It will answer some of the questions regarding the best form of locomotive to be used for various kinds of traffic, and, in fact, many of those about rolling stock that are now regarded as fair topics for speculation. There is little in the foregoing remarks that will be found novel by those who are familiar with the ground that has already been covered by inventors of dynamometers, and in the present article an attempt is made to group together the most useful features developed by various designers, throwing out hints for slight modifications of details in some instances, and at the same time pointing out such parts of former designs and methods of operation as appear to be erroneous. It may seem surprising to some readers that if the details which are here recommended for the dynamometer car of the future are of really great importance, so little attention has been paid to them by former designers of such cars in this country. Heretofore, however, little encouragement has been given to experimenters by railroad officials; and, without this encouragement, it is scarcely possible that a thoroughly reliable dynamometer car can be built. The expense of preparing experimental apparatus and of conducting extended trials would be much greater than any single railroad company could reasonably be expected to incur; but if several companies would unite their contributions, an ample fund could be obtained, requiring but little outlay from each corporation.

We are told that an effort is now being made to secure subscriptions for a series of experiments to be conducted for the benefit of all the subscribers, with as perfect apparatus as can be devised. If this is successful, some reliable data (which are much needed) in regard to the resistance of railroad trains may be obtained.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Lockport & Buffalo.—Extended northeast to Lockport, N. Y., 6 miles, completing the road.

This is a total of 6 miles of new railroad, making 397 miles reported thus far this year, against 297 miles for the same period in 1878, and 327 miles in 1877.

PAYMENT BY DAY FOR CAR SERVICE is again urged by Mr. J. T. Rigney, of the Baltimore & Ohio Railroad, in a paper read at the convention of car accountants which met at Chicago last week, as was done by him in the shorter paper presented at the New York convention a year ago, and which we published shortly afterward. There are certainly some very strong reasons in favor of accepting this as a basis, which Mr. Rigney presents very clearly, among which the simplicity of the plan is not the least. But it does not follow that car mileage should not be reported. Mr. Rigney says that the "profit" by such reports is "nothing, absolutely nothing." Very likely this is true of some roads, which will not make use of valuable information, even when they happen to record or preserve it. But there are many operating questions which cannot be settled definitely without knowing car mileage, and so even if it should have no accounting value—as a check against misuse and a security for full payment—it will still have this statistical value. It is true that it is possible to pay too high a price for such information, and of course we cannot expect that those who never use it will be willing to pay for collecting it. Yet no company can know the mileage of its own freight cars unless it has reports from all the connecting roads on which such cars run.

But terminal roads may object to a per diem charge pure and simple, because they will then have to pay for the use of a car during a time—likely a considerable time—while it is earning nothing either for them or its owners. In most cases our through freight tariffs are so made up as to allow nothing for the terminal expense—the loading or unloading. Yet it is often inevitable that between the time of the arrival of a loaded car at a terminal station and its dispatch back again with a new load some time must elapse. The use of the car during this time is for the benefit of all the roads over which the through rate is pro-rated, just as much as for that one to which the terminal station belongs; yet by Mr. Rigney's plan the latter road would have to bear the whole expense. Doubtless there might be an effectual remedy for this by making a proper terminal charge entirely distinct from the rate for transportation; but, taking things as they are, such a road as the Great Western in a line between Chicago and New York, or the Buffalo-Albany line of the New York Central, a line between Boston and Chicago, would have a great advantage over the terminal roads. It is doubtless for this reason, in part at least, that the rules of the German Railroad Union, which we described recently, make allowances of time for loading and unloading. These rules, however, make a complicated system, more so than either a simple per diem system, such as Mr. Rigney proposes, or the simple mileage system which is now in force in this country.

THE CHICAGO & NORTHWESTERN is expected to become a "Vanderbilt road" at the election next June, at least so far as it will be made so by Mr. Wm. H. Vanderbilt's becoming a director and probably a member of the Executive Committee, if not a higher officer. This is a case, probably, in which the place has sought the man more than the man has sought the place, though it is said that Mr. Vanderbilt has quite a large holding of Northwestern stock. But stockholders are accustomed to look with favor upon Mr. Vanderbilt's becoming their co-partner. It has been noticed that where he comes he usually comes to stay, and that he makes his profits out of dividends, just as the other

stockholders do; which is not always the case with railroad directors, some of whom have been suspected of making money, or trying to, by depreciating the value of their company's stock.

The Northwestern has not and cannot well be made to have, under present circumstances, any special and exclusive connection with the Vanderbilt roads east of Chicago, and there doubtless is no expectation of changing its relations with any of its eastern connections. Indeed it is (fortunately for itself) almost wholly out of the field in which through rates are pro-rated with the trunk lines, the exception being the 85 miles between Chicago and Milwaukee. In the improbable event of one of the other lines between Chicago and the Missouri becoming an exclusive ally of a competitor of the New York Central, then the control of the Northwestern might be valuable to the latter; but we are not likely soon to see that day.

Mr. Vanderbilt and party left New York for Chicago Tuesday evening, and by the time this paper is issued will probably be on a trip of inspection over the Northwestern, which he will find to be a very carefully, skillfully and most economically managed line, with more than twice the mileage of the New York Central (though not nearly twice its "trackage"), spreading like a fan over an immense territory, big enough to make a strong country by itself, and with a future before it. It is, moreover, a growing system, from the nature of its position being compelled to put out branches and extensions almost every year, to keep up with the growth of the country.

RUSSIAN JUSTICE has been occupied with meting out punishment to those whose negligence caused a railroad accident. And, showing that it is no respecter of persons, it tried, not a conductor or engineman, but the chief manager of the road himself, no less a person than Rear Admiral Tchichatchew. As evidence that it acted with due deliberation, it may be mentioned that the accident occurred more than four years ago, while the decision was rendered recently. A railroad embankment on the Odessa Railroad had been damaged by rain, causing a passenger train to be thrown down it, where it caught fire and some 50 persons were killed. The court has just given its decision. It finds the manager to have been chiefly responsible for the accident, because he had knowledge of the damage to the embankment and did not have it repaired before the accident. It therefore declares him guilty of negligence in the performance of his duty. But justice seems to be tempered with mercy in Russia (where admirals are concerned, at least), for the punishment imposed for thus causing the killing of fifty people is—seven days' confinement in his own house in St. Petersburg! It is reported that "the sentence has created a great sensation throughout the country." Which seems likely.

LAKE NAVIGATION opened April 24; vessels have cleared from Chicago for Buffalo, a steamer having entered Buffalo harbor (which is usually closed after the Straits have opened) and a schooner having passed through the Straits of Mackinaw, all on that day. A low-grade vessel, such as is usually not chartered for grain, and in which a cargo of grain is supposed not to be insured, was taken at $4\frac{1}{2}$ cents a bushel for corn that day, the regular rate being 6 cents. The next day the directors of the Vessel-Owners' Association reduced the regular rates to $4\frac{1}{2}$ cents per bushel for wheat, 4 for corn and 3 for oats from Chicago to Buffalo, $\frac{1}{2}$ cent less to Erie; $\frac{1}{4}$ cent more for wheat and corn and $\frac{1}{2}$ cent more for oats to Port Colborne (Welland Canal), etc. The first grain fleet from Chicago, clearing during the past week, consisted of 39 vessels—31 carrying corn (1,179,003 bushels), six carrying wheat (193,152 bushels), one carrying rye (40,000 bushels), and one carrying oats (25,685 bushels). The first vessel cleared just before midnight on Thursday, the 24th of April.

SLEEPING-CAR CHARGES have been made the subject of legislation by the Illinois Senate, in spite of the report of the committee which visited Chicago, investigated the Pullman Company and was unable to find any extortion in its rates. It has passed a bill providing \$1 for a lower berth, \$1.50 for an upper berth, and \$2 for a state room as maximum charges. By this a payment of \$24 would enable 12 persons paying say \$96 for fares to occupy all the room in a car from Chicago to St. Louis which if not fitted with berths would accommodate, without additional expense for transportation, on the part of the railroad, 40 more passengers, whose fares would amount to \$320. The bill has passed but one house, we believe, and it is not probable, we suppose, that it will become a law.

NEW PUBLICATIONS.

Trusses and Arches Analyzed and Discussed by Graphical Methods. Part II. Bridge Trusses. By Charles E. Greene, A. M., Professor of Civil Engineering in the University of Michigan. New York: John Wiley & Sons, 1879. 8vo., pp. 177, with 10 folding plates.

The paper of this book is tinted with a shade said to be very agreeable to the eyes of students. The printing, executed in Boston, is well done, except that the black head-lines of the articles stare one unpleasantly in the eye, and that the diagrams are not as distinct as they ought to have been. About one-half of the work is devoted to ordinary bridge trusses, one-tenth to the flexure of beams and four-tenths to continuous girders and draw-bridges. The plan of the series does not include the determination of dimensions or the discussion of joints, but embraces merely processes for computing on the drawing-board the longitudinal strains in the various truss members. In Part I., on Roofs, the author has

used Maxwell's reciprocal diagrams for this purpose, while here equilibrium polygons and parabolas are mainly employed. The two methods are so different, and the two subjects so distinct, that their presentation in separate volumes is entirely proper.

After explaining in a brief but very clear manner the representation of internal strains by moments and shears, and the further graphical representation of these by equilibrium polygon and the shear diagram, the various forms of American bridge-trusses are described and the graphical method applied for the analysis and determination of their maximum strains. Both single and multiple systems of webbing are discussed, and also inclined chords as well as horizontal. Many of the processes here employed are due entirely to Professor Greene, and those for the analysis of the Post truss and the Linnville double and triple intersection trusses deserve particular mention and praise.

The chapter on deflection is not graphical, and is apparently introduced as an introduction to the theory of continuous beams. The reasoning here we have not found as clear as in other parts of the book.

As the author in his preface requests a candid comparison of his method of treating the continuous girder with the German method, we will give a brief sketch of the steps of each and then make a few remarks.

Professor Greene's method consists in first drawing the equilibrium polygons or parabolas for the separate spans; secondly in measuring the area of each of these polygons, determining its centre of gravity and multiplying each area by the distances of the centre of gravity from the supports. Thirdly, these products, called area moments, are placed as known quantities in certain equations which contain the unknown and desired normal moments. Fourthly, the solution of these equations gives the desired normal moments. Fifthly, from these moments the equilibrium polygons are completed and the shear curves drawn.

The German method, due to Cullman and Mohr, consists first in drawing the equilibrium polygons or parabolas for the separate spans. Secondly, in measuring the area of each of these polygons, determining its centre of gravity and multiplying each area by the distances of the centre of gravity from the supports. Thirdly, these products, called moment areas, serve to construct certain cross lines. Fourthly, from the given lengths of the spans certain points called fixed points are located. Fifthly, by the combination of the cross lines with the position of the fixed points the normal moments are found. Sixthly, from these moments the equilibrium polygons are completed and the shear curves drawn.

From our point of view, we cannot hesitate to give the preference to Greene's method, and yet we can understand that from a purely graphical stand-point one might prefer the other. The German method can be worked on the drawing board from beginning to end, without algebraic equations, and if need be without the use of arithmetic. It can, of course, be shown that the construction of the fixed points and cross lines and their combination is essentially a graphical solution of Greene's equations, and it is because we regard this graphical work as more unsatisfactory than the algebraic that we prefer the latter. Indeed, many engineers in discussing a practical problem of this kind would not use graphics at all, but start at once with the well-known theorem of three moments. A candid comparison is hence a very difficult thing to make, since individual habit is a factor more weighty than arguments. A computer who never draws would select the analytical and arithmetical method; a draughtsman who never computes would choose the graphical method; and each would be justified in thinking his own way the best, because for him it is the best.

Graphical statics has been introduced lately into the courses of study of the engineering schools, and its literature is ever increasing. There is a value in it, we think, independent of its practical applications in finding strains in trusses. It puts before the mind's eye the relations of the forces and strains in a clearer way than analysis can do, and used in connection with analysis, each illustrates and supplements the other. We can recommend Professor Greene's book as particularly adapted to the use of students and as likely to be interesting and valuable to a great many bridge engineers, especially those looking up graphical methods for the first time.

The Pennsylvania Railroad: its Organization, Construction and Management. By James Dredge. London, offices of *Engineering*; New York, John Wiley & Sons. Large quarto, pp. 274. LXXX. plates.

We noticed at the time that with the first number published in 1877, *Engineering*, one of the really great technical journals of the world, began a most elaborate and elaborately illustrated description of the Pennsylvania Railroad, intended to cover its history, organization, administration, construction of road, rolling stock and appliances—a complete description of an American railroad. We do not know that this was ever attempted before; certainly it had never been carried out so elaborately. The most profuse use of drawings was made, and a great many appliances were figured and described which had hardly been adequately described before in any publication.

These articles, with a little other material, have now been republished in this magnificent volume, with a page just about as large as that of the *Railroad Gazette*, and thus giving room for excellent drawings of large structures, such as bridges, cars and locomotives. How far advantage has been taken of this opportunity may be judged by the fact that there are plates of nine bridges, eleven plates of shops, four plates illustrating the Canton elevator at Baltimore, 22 plates of locomotives, tenders and their parts, and 16 plates of cars and car trucks. And besides these plates, many of which occupy two pages, there are 107 engravings

RAILROAD EARNINGS IN MARCH.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.	
	1879.	1878.	Inc.	Dec.	P. c.	1879.	1878.	Increase.	Decrease.	P. c.	1879.	1878.
Atchison, Topeka & Santa Fe.	894	786	108		13.7	\$532,000	\$295,367	\$236,633		80.1	\$595	\$376
Burlington, Cedar Rapids & North.	434	424	10		2.4	111,924	125,141		\$13,217	10.6	258	295
Cairo & St. Louis.	146	146				19,551	19,843			1.5	134	136
Central of Iowa.	190	190				54,506	55,887			1.081	1.9	287
Central Pacific.	2,180	2,067	113		5.5	1,280,000	1,228,592	51,408		4.9	591	564
Chicago & Alton.	678	678				344,376	357,297		12,921	3.6	508	527
Chicago & Eastern Illinois.	159	159				67,025	58,506	8,519		14.6	422	368
Chicago, Milwaukee & St. Paul.	1,772	1,414	358		25.3	633,000	663,639		30,639	4.6	357	469
Chi. & N. Western.	2,150	2,078	81		3.9	1,101,000	1,095,884	5,116		0.5	510	526
Cleveland, Mt. Vernon & Del.	157	157				29,803	30,427		624	2.1	190	194
Galveston, Houston & Henderson.	50	50				38,445	31,069	7,376		23.7	709	621
Hannibal & St. Joseph.	292	292				190,134	190,365	231		18.6	651	549
Illinois Central, Illinois lines.	854	818	36		4.4	410,005	402,847	7,158		3.3	487	492
Iowa lines.	402	402				124,878	133,562		8,684	6.5	311	332
Indianapolis, Bloomington & Western.	212	212				80,587	113,400		32,813	29.0	380	461
International & Great Northern.	516	516				122,097	100,125	21,972		22.0	237	194
Kansas Pacific.	673	673				340,951	275,281	65,670		23.9	507	409
Missouri, Kansas & Texas.	780	780				224,550	236,546		11,996	5.1	286	301
Mobile & Ohio.	527	527				163,227	165,755		2,528	1.5	310	315
Nashville, Chattanooga & St. Louis.	349	349				140,497	143,257		2,760	4.4	428	410
Philadelphia & Erie.	288	288				212,735	188,511	24,224		12.9	739	655
Philadelphia & Reading.	800	800				1,041,142	895,334	145,808		49.8	1,301	869
St. Louis, Alton & Terre Haute.	71	71				43,270	38,886	4,384		11.3	609	548
Belleville Line.	685	685				352,580	344,198	8,382		2.5	515	502
St. Louis, Iron Mt. & Southern.	530	530				320,186	299,825	20,361		6.8	604	566
St. Louis, Kansas City & North'n.	354	354				95,890	93,003	2,887		3.0	271	263
St. Louis & Southeastern.	160	160				24,579	18,450	6,129		33.1	240	185
Scioto Valley.	237	237				91,257	108,845		17,588	16.2	385	459
Toledo, Peoria & Warsaw.	688	688				338,050	400,808		62,758	15.7	491	583
Wabash.												
Total.	17,183	16,477	706			\$8,552,216	\$7,880,440	\$671,776		8.5	\$498	\$478
Total increase.			706		4.3			\$671,776				

RAILROAD EARNINGS, THREE MONTHS ENDING MARCH 31.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1879.	1878.	Inc.	Dec.	P. c.	1879.	1878.	Increase.	Decrease.	P. c.	1879.	1878.	Inc.	Dec.	P. c.
Atchison, Top. & S. Fe.	889	786	103		13.1	\$1,230,074	\$654,850	\$575,124		88.0	\$1,385	\$833	\$552		66.3
Burlington, Cedar Rapids & Northern.	434	424	10		2.4	326,563	437,749		\$101,186	25.4	752	1,032		\$280	27.1
Cairo & St. Louis.	146	146				51,000	43,858	7,142		17.8	354	300		54	17.8
Central Pacific.	2,180	2,067	113		5.5	3,380,517	3,320,109	60,408		1.8	1,551	1,606		55	3.4
Chicago & Alton.	678	678				958,557	958,557			3.9	1,408	1,414		55	3.9
Chicago & Eastern Illinois.	159	159				182,308	182,308			7.2	1,230	1,147		85	7.2
Chicago, Mil. & St. Paul.	1,742	1,414	328		23.3	1,701,000	2,036,357		335,357	16.5	960	1,440		480	33.3
Chi. & N. W.	2,150	2,078	81		3.9	3,040,230	3,258,632		218,402	6.7	1,408	1,568		160	10.2
Cleveland, Mt. V. & Del.	157	157				83,288	86,705		3,417	4.0	530	553		23	4.0
Galveston, H. & H.	50	50				130,965	102,172	28,793		28.2	2,619	2,043		576	28.2
Grand Trunk.	1,390	1,390				2,180,209	2,298,144		117,935	5.0	1,599	1,653		54	5.0
Great Western.	511	511				1,050,791	1,214,630		163,839	12.7	2,074	2,376		302	12.7
Hannibal & St. Joseph.	292	292				460,225	419,505	40,720		9.7	1,578	1,433		145	9.7
Illinois Central, Ill. lines.	854	818	36		4.4	1,245,903	1,370,945		125,042	1.9	1,459	1,533		74	1.9
Iowa lines.	402	402				321,317	401,810		80,493	20.3	799	969		170	20.3
Ind., Bloom. & Western.	212	212				264,090	315,045		51,955	19.3	1,246	1,489		243	19.3
International & Gt. Nor.	516	516				431,241	347,740	83,501		24.0	836	674		162	24.0
Kansas Pacific.	673	673				788,017	637,732	150,285		21.6	1,170	948		222	23.6
Missouri, Kan. & Tex.	780	780				613,809	634,492		20,683	3.3	781	807		26	3.3
Mobile & Ohio.	527	527				518,827	507,737	11,090		17.2	885	1,189		304	17.2
Nash. Chattanooga & St. L.	349	349				464,800	470,843		6,043	1.3	1,369	1,369			1.3
Philadelphia & Erie.	288	288				692,502	589,514	102,988		12.4	2,300	2,047		253	12.4
Philadelphia & Reading.	800	800				2,870,222	1,894,724	981,498		51.8	3,595	2,308		1,287	51.8
St. Louis, Alton & T. H.	71	71				135,692	714,148	21,744		18.0	1,911	1,008		303	18.0
Belleville Line.	685	685				1,025,770	1,061,037		35,267	3.3	1,497	1,549		52	3.3
St. Louis, Iron Mt. & So.	530	530				843,253	799,158	44,095		5.5	1,591	1,508		83	5.5
St. Louis, K. C. & Nor.	354	354				267,541	261,005	6,536		2.2	756	739		17	2.2
St. Louis & Southeastern.	160	160				65,737	44,984	20,753		40.4	657	449		208	40.4
Scioto Valley.	237	237				263,788	334,189		70,401	21.1	1,113	1,410		297	21.1
Toledo, Peoria & War.	688	688				978,738	1,082,362		103,624	9.6	1,423	1,573		150	9.6
Wabash.															
Total.	18,889	18,188	701			\$26,604,213	\$25,906,721	\$697,492		2.7	\$1,408	\$1,424		\$16	1.1
Total increase.			701		3.9			\$697,492							

in the text. Some of the latter are simply views on the road, the same as were published in the beautiful book, "The Pennsylvania Railroad, Historical and Descriptive," which the company published a few years ago and which we have heretofore noticed. But many of them are technical, and will be useful. With these are the plans of the shops at no less than seventeen different places. There are also a great many tables, among which those of the dimensions, weights and capacities of the different cars on the Pennsylvania Railroad, and on various European roads, may be mentioned as of special interest, giving information which usually has been hard to get.

The work has a value for every railroad man, for nowhere else can be found so complete a description of an American railroad and its appliances, though all the illustrations are from the practice of the Pennsylvania Railroad. For a few weeks it is offered by the publishers at a lower price than will be charged for it afterwards.

Transportation in Congress.

In the House on the 30th: Mr. Clymer, of Pennsylvania, from the Appropriations Committee, reported a bill appropriating the requisite amount to J. B. Ends and associates, the sum due, and to become due, for constructing jetties and other works at South Pass, Mississippi River. He explained that the depth of 25 feet having been attained, there was now due \$500,000, and that it was expected the depths of 26 feet and 30 feet would be obtained before the next session of Congress; and that if the amounts which would then become due were not paid in money, they would have to be paid in 5 per cent. bonds, which were worth a considerable premium. The bill had been drawn by the Secretary of War, and met the approval of the Secretary of the Treasury. In response to inquiries, he said that the committee had not inquired into the merits of the work, but had simply complied with the existing law on the subject, but he added that there was no intimation or suggestion by the committee tending to cast any doubt on the success of the work. The bill was passed.

—Speaking of Mr. De La Matyr's bill to issue \$1,000,000,000 greenbacks and make loans to various projects, a correspondent suggests that it would be well to make the greenbacks unlimited, and pay off all railroad debts, which would be a great relief.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:
New York Central & Hudson River, annual meeting, in Albany, N. Y., June 4. Transfer books close May 3.
New York & Harlem, annual meeting, at the Grand Central Depot in New York, May 20, at noon.
St. Louis, Alton & Terre Haute, annual meeting, at the office in St. Louis, June 2.
Detroit, Lansing & Northern, annual meeting, at the office in Detroit, May 14.
Flint & Pere Marquette, annual meeting, at the office in Saginaw, Mich., June 4.
Chicago & Northwestern, annual meeting, at the company's office in Chicago, June 5, at 1 p. m. Transfer books close April 30.

Railroad Conventions.

Master Mechanics' Association, annual convention, at the Grand Hotel in Cincinnati, May 13.
The Passenger Conductors' Life Insurance Association will hold its eighth annual convention in Philadelphia, May 21.
The Master Car-Builders' Association will hold its annual convention at the Grand Pacific Hotel, in Chicago, beginning on Tuesday, June 10.
The American Society of Civil Engineers will hold its eleventh annual convention in Cleveland, O., beginning June 17.

Dividends.

Dividends have been declared as follows:
New York, Providence & Boston, 2 per cent., quarterly, payable May 10.
East Tennessee, Virginia & Georgia, 3 per cent., semi-annual, payable May 1.
Manchester & Lawrence, 5 per cent., semi-annual, payable May 1.
Boston & Albany, 4 per cent., semi-annual, payable May 15.
Concord, 5 per cent., semi-annual, payable May 1.
Boston, Concord & Montreal, 3 per cent., semi-annual, on the preferred stock, payable May 5.
Cedar Rapids & Missouri River (leased to Chicago & Northwestern), 1 per cent., quarterly, payable May 1.
Cincinnati, Sandusky & Cleveland, 3 per cent., semi-annual, on the preferred stock, payable May 1.

Pullman Palace Car Co., 2 per cent., quarterly, payable May 15.
Republican Valley (leased to Burlington & Missouri River in Nebraska), 2 per cent., quarterly, payable May 1.

Mail Service Extensions.

Mail service has been ordered over railroad lines as follows:
Memphis, Kansas & Colorado, service extended from Weir, Kan., to Brownsville, Mo., 13.04 miles.
East Line & Red River, service extended from Winnsboro, Tex., to Sulphur Springs, 22.91 miles.
Pennsylvania, service ordered on **Columbia & Port Deposit Branch** from Columbia, Pa., to Port Deposit, Md., 39.65 miles.

Foreclosure Sales.

The Ridgefield Park Railroad was sold under a decree of the New Jersey Court of Chancery, April 18, and bought in for account of the Jersey City & Albany Company. The road extends from the New Jersey Midland at Ridgefield Park, N. J., northward 12 miles to the New York state line. In 1873 the company was consolidated with the Rockland Central as the Jersey City & Albany. That company's property has been sold under foreclosure of its mortgage and the company partly reorganized, the present sale being under the underlying mortgage for \$500,000 made by the original company. The purchase has been made by agreement with the bondholders, who consent to receive income bonds of the reorganized company for their old bonds.

The section of the **Chicago & Lake Huron** road from Port Huron, Mich., to Flint, 66 miles, formerly the **Port Huron & Lake Michigan** road, is advertised to be sold in Detroit, May 21, under a decree of foreclosure and sale granted by the United States Circuit Court. The Port Huron & Lake Michigan Company was consolidated with the Peninsular Company in 1873 as the Chicago & Lake Huron. The present sale, however, is to be made under its separate mortgages, under which \$1,000,000 first and \$540,000 second mortgage bonds are outstanding. Our readers are familiar with the long and complicated litigation attending the foreclosure.

The **Chicago & Pacific** road will be sold in Chicago, May 1, under the decree of foreclosure lately granted by the United States Circuit Court. The sale will include the 88 miles of road from Chicago to Byron with all the equipment, etc., and the right to extend from Byron to Savannah on the Mississippi. It will be made subject to certain mortgages on the depot grounds and other property, amounting to \$156,170 in all.

Master Mechanics' Convention.

Mr. J. H. Setchel, the Secretary, issues a circular announcing that the twelfth annual meeting of the American Railway Master Mechanics' Association will be held on the 13th, 14th and 15th of May, 1879, at the Grand Hotel, in the city of Cincinnati. This magnificent hotel has been selected as headquarters, where the members and their families will be entertained at \$2.50 per day. Those intending to be present will confer a favor upon the committee by sending their names to the Chairman as early as possible, that rooms may be reserved for them. The committee consists of J. H. Setchel, James Eckford, S. S. Filson. Those wishing rooms will address J. H. Setchel, Cincinnati, O.

Car Accountants' Association.

The fourth annual convention assembled at the Grand Pacific Hotel, Chicago, April 23, the following members being present:

J. W. Reinhardt, Allegheny Valley; D. M. Monjo, Anderson Refrigerator Line; A. W. Davies, Atlantic & Great Western; H. P. Jaques, Atchison & Nebraska; J. T. Rigney, Baltimore & Ohio; J. A. Wilson, Baltimore & Potomac; A. J. Chapin, Boston & Albany; R. Burns, Canada Southern; W. H. Allport; J. K. Cavanaugh, Central of Iowa; John P. Moore, Chicago & Alton; F. M. Luce, Chicago & Northwestern; T. W. Cook, Chicago, Burlington & Quincy; N. R. Parsons, Chicago, Clinton, Dubuque & Minnesota; W. E. Beecham, Chicago, Milwaukee & St. Paul; G. E. Weir, Chicago, Rock Island & Pacific; S. B. McConico, Chicago, St. Louis & New Orleans; W. J. Mulvihill, Cincinnati, Hamilton & Dayton; C. L. Williams, Cincinnati, Sandusky & Cleveland; G. C. Mather, Columbus & Hocking Valley; J. F. Reekie, Detroit, Lansing & Northern; C. L. Freer, Eel River; D. W. Moor, Grand Rapids & Indiana; John Hunt, Grand Trunk; J. Farnsworth, Great Western Dispatch; J. W. Fuller, Hoosac Tunnel Line; A. W. Briggs, Illinois Central; G. H. Weeks, Lake Shore & Michigan Southern; H. T. Curd and J. T. Gallagher, Louisville & Nashville; S. C. Annable, Michigan Central; E. W. Brundage, Missouri, Kansas & Texas; H. F. Woodman, Northern Central; H. N. Eastman, Pittsburgh, Cincinnati & St. Louis; J. J. Morcom, St. Louis, Kansas City & Northern; H. R. Payne, Standard Oil Company; W. S. Palm, Toledo, Peoria & Warsaw; F. A. Nash, Union Pacific; C. P. Church, Wabash; W. A. Given, Wisconsin Central; A. W. Cobb, Mineral Point; James B. Garrett, Selma, Rome & Dalton; W. H. Green, Richmond & Danville; E. H. Beckley, Cincinnati, Wabash & Michigan; A. D. Smith, Erie & Pittsburgh.

Mr. G. W. Jones, of the Pennsylvania Railroad was Chairman, and Mr. F. M. Luce Secretary.

After a Committee on Credentials had been appointed and reported, the Committee on Constitution presented its report. The constitution as amended by the committee was adopted. It is substantially as follows:

1. The title shall be "The Railway Car Accountants' Association of the United States and Canada." 2. The membership shall be composed only of car accountants or such other officers or persons in charge of car accounts of railway companies, or such persons or officers as the management of the companies may authorize to represent them. 3. Members only shall participate at meetings of the conventions, but representatives of fast freight lines, oil tank lines, or private car companies, may sit as members, but will not be allowed to vote on any question pertaining to the method or manner of keeping car records and making reports of car movements. 4. The object and purpose of the association is the promotion and advancement of the manner of keeping correct records of car movements and mileage. 5. The association shall hold one regular meeting each year, and each convention shall fix the time and place of each successive meeting. 6. In the decision of all questions by the association each representative shall be entitled to but one vote. No member shall be allowed to cast an additional ballot for any branch or leased line. 7. The officers of this association shall consist of a president, vice-president, secretary and assistant secretary, who shall act as treasurer; all of whom shall be elected annually at the regular meeting. 8. Officers shall be elected by ballot—plurality of all votes cast necessary for an election. Members only are eligible to office. 9. Assigns the duties usually devolved upon the officers, provides for the publication of the proceedings of each meeting immediately after adjournment, and the sending of two copies thereof to each member. 10. All persons named in article 2 may become members upon signing

the constitution or requesting the Secretary by letter to do so.

The next order of business was the election of officers for the ensuing year. The result of the ballot was as follows: A. W. Briggs, President; C. P. Chesebro, Vice-President; F. M. Luce, Secretary; D. W. Moor, Assistant Secretary.

At the afternoon session on the first day the question discussed was: "What are the advantages and benefits of the daily individual car reports, as compared with the clearing-house system, as regards correctness, economy and promptness in locating cars?"

The discussion turned largely on the experience of the New England roads with their clearing-house in Boston. It was stated that this had given great satisfaction so far, though no full report of its workings would be made until it had been in operation a year. It was doubted by some whether the system could be much extended.

On the second day's session the first regular question before the Association was: "Should cars belonging to private firms and corporations be paid mileage?"

After some discussion this was finally postponed, until the sense of the managers could be obtained.

Next followed discussion on "Is a system of demurrage for the unreasonable detention of cars on foreign roads desirable? If so, what should be the limit of time beyond which demurrage should be paid, and what should be the rate per diem allowed?"

This called out an extended discussion, in which many of the members joined, and many statements were submitted showing average mileage at home and abroad. At the close of the discussion the following resolutions were adopted:

Resolved, That this convention reiterates the conviction expressed in a resolution passed at the convention held in New York, in April, 1878, to the effect that a plan of demurrage for the detention of cars beyond a reasonable length of time at any given point is highly desirable, and is deemed necessary in order to affix a penalty for the careless and tardy handling of cars.

Resolved further, That it is the opinion of this convention the limit of time beyond which demurrage shall be charged should be four days, and the rate per diem charged should be 50 cents.

Other subjects discussed were:

"Should a uniform report of managers of monthly car movement and mileage be adopted, and if so, what is the best form for such report?"

On this point the following resolution was adopted:

Resolved, That it is the sense of this convention that the form of monthly report to managers of movement and mileage submitted by the committee on 'subjects for discussion,' is a very desirable one and should be uniformly adopted by all roads, and that the members of this convention will adopt the same, so far as their managers will consent, immediately on their return home.

There was also a long discussion on the question: "What is the best way to card cars delivered to connections in order to insure their return via route delivered, or to request their return by a different connection, if the latter is mutually advantageous?"

This was closed by the adoption of the following:

Resolved, That it is the sense of this convention that all foreign cars should, on leaving the road to which they belong, have a card placed on them showing by what route they are to be returned, and that a committee of three be appointed to prepare a form of card suitable for that purpose.

The third day was chiefly occupied in the discussion of the question: "Is the adoption of a *per diem* system of compensation for the use of cars desirable or feasible?"

On this subject Mr. J. T. Rigney, of the Baltimore & Ohio, read a carefully-prepared paper, which is published elsewhere. There was also a general expression of opinion, but no action was taken. A general interest was taken in this matter, and the discussion was interesting.

The meeting was closed with the usual routine business, resolutions, etc. It was decided to hold the next convention in Louisville, Ky., and the Association adjourned to meet in that city April 23, 1880.

ELECTIONS AND APPOINTMENTS.

Allegheny Valley.—The Board of Managers met in Philadelphia, April 23, and re-elected John Scott, President; E. H. Utley, Secretary; Thomas Robinson, Treasurer.

Atlantic & Pacific Telegraph.—At the annual meeting in New York, April 30, the following trustees were elected: Edwin D. Morgan, Augustus Schell, Hamilton McK. Twombly, Norvin Green, James H. Banker, Chauncey M. Depew, Harrison Durkee, Thomas T. Eckert, W. J. Syms, John H. Mortimer, Sidney Dillon, R. H. Rochester, Henry M. Taber, Albert B. Chandler, S. F. Barger.

Car Accountants' Association.—The officers chosen at the annual convention in Chicago, last week, were: President, A. W. Briggs, Illinois Central; Vice-President, C. P. Chesebro, Wabash; Secretary, F. M. Luce, Chicago & Northwestern; Assistant Secretary and Treasurer, D. W. Moor, Grand Rapids & Indiana.

Central Ohio.—At the annual meeting in Columbus, O., April 30, the following directors were chosen: Hugh J. Jewett, J. R. Swan, Wm. Dennison, W. B. Brooks, J. W. Hall, W. J. Jenkins, Upshur Johnson, John King, Jr., David Lee, Robert Garrett, J. G. Harvey, Daniel Applegate, W. H. Clement. The road is leased to the Baltimore & Ohio.

Colorado Western.—The directors of this new company have elected W. A. H. Loveland President; Thomas I. Richman, Vice-President; Foster Nichols, Secretary; J. A. Thatcher, Treasurer.

Detroit, Monroe & Toledo.—At the annual meeting, April 22, the following directors were chosen: Amasa Stone, Charles Paine, H. B. Payne, Addison Hills, C. P. Leland, Albert Keep, John Newell, Philo Morehouse, W. L. Scott, Augustus Schell, E. D. Worcester. The road is owned by the Lake Shore & Michigan Southern.

Empire Line.—From May 1 the office of George W. Ristine, General Freight Agent, is at No. 80 Superior street, Cleveland, O. The office of Charles E. Furness, Assistant General Freight Agent, remains at No. 243 South Fourth street, Philadelphia.

Gainesville, Ocala & Charlotte Harbor.—The officers of this company, lately chosen, are: President, H. C. Howard, Champaign, Ill.; Vice-President, J. J. Brown, Gainesville, Fla.; Treasurer, B. F. Matthias, Paris, Ill.; Secretary, N. R. Gruelle, Gainesville, Fla.

Green Bay & Minnesota.—At the annual meeting in Green Bay, April 7, the following directors were elected: W. J. Abrams, Rufus B. Kellogg, Green Bay, Wis.; John I. Blair, Blairtown, N. J.; Benjamin G. Clark, Jersey City, N. J.; Wm. E. Dodge, E. F. Hatfield, Jr., Percy R. Pyne, Samuel Sloan, Moses Taylor, New York.

Gulf, Western Texas & Pacific.—At the annual meeting in Indianola, Tex., April 7, the following directors were chosen: A. De Costa, A. C. Hutchinson, M. D. Monserrate,

D. C. Proctor, Henry Sheppard, F. S. Stockdale, Charles A. Whitney. The board re-elected Henry Sheppard President; F. S. Stockdale, Vice-President; M. D. Monserrate, Secretary and Treasurer.

Kansas City, Fort Scott & Gulf, and Kansas City, Lawrence & Southern.—The following appointments are announced for these roads: J. L. Barnes, Assistant Superintendent; J. S. McCrum, Master Mechanic; J. M. Buckley, Superintendent of Track, Bridges and Buildings; J. N. Watkins, General Freight Agent; J. E. Lockwood, General Ticket Agent; H. C. Sprague, Superintendent of Telegraph. Offices at Kansas City, Mo.

Louisville & Nashville.—The following circular is dated April 21, and signed by F. de Funiak, Chief Engineer and Superintendent of Machinery:

"Mr. C. W. White, who has been acting as Master Mechanic at Birmingham, is from this date on appointed Master Mechanic of the South & North Alabama Railroad, and will have entire charge of the mechanical department at Birmingham, and on the line of the road, including Decatur and Montgomery stations, and will be respected and obeyed accordingly. He will report to Mr. B. Dunham, Superintendent, Birmingham, Ala., except in matters pertaining to construction of new work, for which plans and instructions will be given from this office, same as to all other division master mechanics."

New Jersey & New York.—Mr. J. D. Haabrouck has been appointed Superintendent, in place of L. D. Bruyn, resigned.

Northwestern Ohio.—The board has elected the following officers: President, Thomas D. Messler, Pittsburgh; Treasurer, W. H. Barnes, Pittsburgh; Secretary, Frank Jones, Toledo, O.; Assistant Secretary, S. B. Lidgett, Pittsburgh. The road is leased to the Pennsylvania Company.

Pemberton & Hightstown.—At the annual meeting in Hightstown, N. J., April 17, the following directors were chosen: John G. Stevens, Ashbel Welch, Edward T. Green, Nathaniel S. Rue, James W. Allen, Alexander Shreve, Joseph Holmes, Collin B. Meirs, Nicholas Wain, Jr. The board elected Nathaniel S. Rue President; James W. Allen, Vice-President; James L. Rue, Secretary; Collin B. Meirs, Treasurer. The road is leased to the United New Jersey, and sub-leased to the Pennsylvania.

Pittsburgh & Castle Shannon.—The United States District Court at Pittsburgh has appointed W. W. Martin Receiver of this road.

St. Louis, Iron Mountain & Southern.—The new board has elected Thomas Allen, President; H. G. Marquand, Vice-President; D. W. Williams, Treasurer; S. D. Barlow, Secretary and Assistant Treasurer; A. W. Soper, General Superintendent. These are the old officers, with the exception of General Manager W. R. Arthur, who retires.

Sharpsville & Lake Shore.—This company has been organized with the following officers: President, Walter Pierce, Sharpsville, Pa.; Directors, Joseph Forker, B. H. Henderson, John Phillips, J. J. Spearman, Sharon, Pa.; J. M. Goodwin, Frank Pierce, J. J. Pierce, Sharpsville, Pa.; Secretary and Engineer, J. M. Goodwin, Sharpsville, Pa.; Treasurer, Frank Pierce, Sharpsville, Pa.

Wabash.—Mr. Sidney Dillon has been chosen a director, in place of J. B. Colgate, resigned.

Mr. C. A. Brown has been appointed Traveling Passenger Agent for New England and the Maritime Provinces, with headquarters in Boston, from May 1. Mr. Brown was recently Passenger Agent for the Central Vermont.

Wabash & Erie.—The following officers were chosen at a recent meeting in Peru, Ind.: President, A. N. Dukes; Vice-President, James Lillie; Secretary, C. B. Knowlton; Treasurer, E. N. Shirk; General Superintendent, A. G. Wells.

PERSONAL.

—The report that Gen. Alfred P. Rockwell's resignation as President of the Eastern Railroad Company was due to trouble in the board, is contradicted by authority. He resigns simply because he has been offered a position at a higher salary than the Eastern can afford to pay, and the board accepted his resignation very unwillingly. It is stated that the new president will not be called upon to take the general management of the road as Gen. Rockwell has done, but that a General Manager will be appointed. Mr. J. F. Barnard, of the Kansas City, St. Joseph & Council Bluffs, and Mr. E. B. Phillips, are mentioned for the new position, and there are several other candidates.

—George G. Barnard, known in the flush days of the Tammany Ring as the "Erie Judge," died in New York, April 27. He was Judge of the New York Supreme Court, and was notorious chiefly for the many injunctions and other orders made by him in the litigation by and against the Gould-Fisk party when in possession of the Erie. He was removed by impeachment in 1873, and has since lived in retirement.

—Mr. W. G. Oakman, Superintendent of the Utica Division of the Delaware, Lackawanna & Western, was married in Utica, N. Y., April 30, to Miss Bessie Conkling, daughter of Senator Conkling.

—Mr. Samuel S. Moon, publisher of the *Railway World*, died at his residence in Philadelphia, April 29, aged 56 years. He was brought up a printer, but left the trade for a time and was a clerk in the office of the old Philadelphia & Columbia road, having at one time Thomas A. Scott as a fellow clerk. After serving there and with the Commonwealth Insurance Company for several years, he started the *American Exchange and Review*, which he sold a few years later and bought the old *United States Railroad and Mining Register*, changing it to the present form and its name to the *Railway World*. Mr. Moon was highly esteemed by all who knew him.

—Mr. Godfrey W. Rhodes, Superintendent of Motive Power of the Northern Central Railway, has resigned to accept a position on the Pittsburgh, Cincinnati & St. Louis road. The employees of the Northern Central held a meeting to prepare a suitable testimonial of their respect and esteem for Mr. Rhodes.

—Hon. Jacob Vannatta, one of the most prominent of New Jersey lawyers, and at one time Attorney General of the state, died at his residence in Morristown, April 29, aged 54 years. For a number of years he has been Counsel for the Morris & Essex and the Delaware, Lackawanna & Western companies.

TRAFFIC AND EARNINGS.

Iowa Local Freight Rates.

A dispatch from Des Moines, Ia., says: "Last month the Railroad Commissioners of Iowa having previously notified the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific and the Chicago & Northwestern companies of sundry complaints on account of the recent increase in their rates, had an official interview with the managers

of the companies, at which the subject was considered at length. The managers of these companies claimed that their increase in rates was but slight and maintained that they were in no just sense unfair. The commissioners, nevertheless, insisted upon a modification of the advanced rates, a request which the managers agreed to consider at an early day, and report the result of their deliberations. This has been done, and a new or modified tariff has been furnished to the commissioners and took effect to-day. Rates in general have been reduced, those on coal being the same as those fixed by the Iowa granger law of 1874, lumber rates being nearly as low as those on salt, cement, stucco and lime being lower than granger rates. There is a small reduction from the increased tariff on grain on short hauls and more liberal reduction on several classes of merchandise, with a similar reduction on flour and meal, a slight reduction on sheep and a still larger one on classified freight. They also create a new or fourth class, for which they have made a lower rate, the granger law having no Class D. The result of this matter is very satisfactory to the people here and doubtless will be all over the state.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:	1878.	1877.	Inc. or Dec.	P. c.
New Jersey Southern.	\$344,920	\$353,806	D. \$8,886	12.4
Net earnings.....	20,251	55,547	D. 35,296	63.6
Business.....	102,017	102,734	D. 717	0.7
Net earnings.....	20,914	35,364	D. 14,450	15.4
Three months ending March 31:				
1879.	1878.			
Philadelphia & Erie..	\$693,502	\$589,514	I. \$103,988	12.4
Net earnings.....	225,410	180,911	I. 44,499	24.6
St. Louis & South-eastern	267,541	261,895	I. 5,646	2.2
Net earnings.....	63,338	52,942	I. 10,396	19.7
Month of February:				
Alabama Great South-ern	\$33,064	\$32,555	I. \$509	1.7
Del. & Hudson Canal Co., leased lines.	320,181	271,756	I. 48,425	17.8
Net earnings.....	94,428	105,045	D. 11,217	10.6
Month of March:				
Boston & New York Air Line.	\$20,902			
Net earnings.....	13,305			
Third week in April:				
Chicago & Alton.....	\$60,906	\$88,540	I. \$27,634	2.7
Chicago, Mil. & St. Paul.	103,000	103,594	D. 594	15.8
St. Louis, Iron Mt. & Southern.	85,000	73,986	I. 11,014	14.9
Wabash.....	84,088	81,023	I. 3,065	4.5
Week ending April 18:				
Great Western.....	\$81,049	\$81,002	D. \$47	
Week ending April 19:				
Grand Trunk.....	\$171,024	\$170,006	I. \$1,018	0.2

Coal Movement.

Coal tonnages for the week ending April 19 are reported as follows:

	1879.	1878.	Increase.	P. c.
Anthracite.....	475,249	102,263	282,986	147.2
Semi-bituminous.....	77,286	69,486	7,800	2.6
Bituminous, Pennsylvania	44,162	58,040	5,522	14.3
Coke, Pennsylvania	11,402			

The Sewanee Coal & Coke Works are now shipping coke from Cowan, Tenn., on the Nashville, Chattanooga & St. Louis road, to iron works in St. Louis and Terre Haute, Ind. The freight from Cowan to Terre Haute is 5 cents per bushel, or \$30 per car. The same works are delivering coke in Chattanooga at 4 cents per bushel.

Grain Movement.

Receipts and shipments of grain of all kinds at the eight leading Northwestern markets, and receipts at the seven Atlantic ports, for the week ending April 19 for the past six years have been, in bushels:

Year.	Northwestern.	Atlantic.
1874.....	3,164,379	4,628,359
1875.....	2,667,500	4,280,426
1876.....	2,009,581	2,867,042
1877.....	2,517,399	2,268,531
1878.....	4,030,622	3,592,016
1879.....	2,503,480	3,256,009

The receipts of the Northwestern markets are the smallest of the year, their shipments the largest, and the largest ever made by rail alone. The receipts at Atlantic ports are also the largest of any week when navigation was closed, and previous to 1878 they were never equaled while navigation was open except in four weeks of the year 1876.

Of the Atlantic receipts this year, 40.3 per cent. arrived at New York, 26.2 at Philadelphia, 20.6 at Baltimore, 7 at Boston, 4.4 at New Orleans, 1.4 at Portland, and 0.1 at Montreal. New York's receipts are the largest and Philadelphia's much the largest, Baltimore's are the smallest for four weeks, but still much above its average for the year.

Though such a rail traffic was never known before, the war over Missouri River points traffic will tend to increase it still more. The season, however, at this time demands usually the whole time of the farmer and his teams in putting in crops, so that there may not be much stimulation to Kansas, except so far as quantities in store at the stations are concerned. Current rates from St. Louis and Chicago alike amount to 12 cents per bushel on wheat to New York. Lake vessels charged 6½ cents for their first cargo down from Chicago to Buffalo, and though this was soon reduced to 4½ cents, it will require an exceptionally low canal rate to make the water rate as low as the rail rate. If lake rates should be maintained, there would be no inducement to take grain from the interior to Chicago to ship, especially from points south and southwest. But there is no prospect that they will be maintained at anything like these figures, and they may fall to 2 cents for wheat and 1½ for corn, as they were for a month or six weeks last year.

San Francisco receipts for the week ending April 19 were 6,233 barrels flour, 313,733 bushels wheat, 27,915 bushels barley and 7,143 bushels other grain; total, reducing flour to wheat, 379,956 bushels.

Shipments from the East to Missouri River Points.

Under date of April 28, the following, entitled "Circular No. 150," was issued by Mr. Albert Fink, Trunk Lines Commissioner:

"For the purpose of preventing the present war of rates west of Chicago and Mississippi River extending to the Eastern roads, it has been agreed that hereafter, commencing April 28, all freight destined to Missouri River points shall be billed to destination, but the rates will be given and guaranteed only to Mississippi River points, including St. Louis, and these rates will be the same as the proportions which are now being charged under the regular tariff rates up to these points.

"The above modifies the directions given in Circular No. 140, only in so far that all Missouri River freight going via Chicago is to be billed to Mississippi River points at the rates above named, instead of being billed to Chicago.

"The rates reported to have been made by the Wabash

Railway to Missouri River points from the East have been withdrawn.

"In explanation of the above arrangements, it will be mentioned that the object of the roads represented on the Joint Executive Committee is to put the roads through Chicago and St. Louis and Hannibal upon precisely the same footing, confining the present war of rates to the territory west of the Mississippi River.

"The cooperation of all interested parties in carrying out this plan is relied upon, for the reason that a departure from it cannot benefit any parties, as the amount of traffic passing through Chicago and St. Louis is determined by existing agreements, and cannot be changed by any reduction or adjustment in rates that could possibly be made by the roads west or east of Chicago and St. Louis."

This was followed the same day by the following, entitled "Circular No. 151:"

"As the directions in regard to billing freight to Missouri River points, given in circular No. 150, have been misunderstood, in order to make the same more explicit, the following directions are substituted and will hereafter be observed.

"Bills of lading for freight destined to Missouri River points (namely, Kansas City, St. Joseph, Atchison, Leavenworth) will hereafter be given only to Mississippi River points, at the following rates:

1st class.	2d class.	3d class.	4th class.
96	78	66	54

"No change, however, is to be made in the method of billing freight or in the proportion charged by the roads east of the points named, on freight destined to Missouri River points."

Chicago Lake Rates.

The Vessel-Owners' Association made the following rates on grain from Chicago last Friday, which, at latest advices, were still in force:

	Wheat.	Corn.	Oats.
To Buffalo.....	4½	4	3½
" Erie.....	4½	3½	3
" Port Colborne.....	4½	4½	3½
" Oswego.....	8½	7½	5
" Kingston.....	8½	7½	5
" Ogdensburg.....	9½	8½	6
" Lake Erie ports west of Erie.....	4½	3½	3½
" Sarnia.....	3½	3	2½
" Colerich.....	3½	3	2½
" Collingwood.....	3½	3	2½

These rates were announced to rule "until otherwise ordered."

Saginaw Valley Lumber Rates to the East.

The following is taken from a circular issued by D. Edwards, General Freight Agent of the Flint & Pere Marquette Railway, but the rates and methods described are doubtless the same on all the railroads to the Saginaw Valley. The circular is addressed:

"To manufacturers and shippers of lumber, lath, shingles and staves:

"After the continuous appeals and urgent solicitations of our company, the Eastern railroads connecting with us have consented to establish specific rates on lumber, lath, shingles and staves, for a period of one year, as an experiment to see if such will stimulate and increase the shipment of lumber, lath and shingles by rail all the way, as against water, or rail and water.

"We have promised these roads a large increase of shipments by rail, basing our promise on the statements of some of the manufacturers, that if they could secure stability of rates, so as to be able to contract to deliver for a period of six months ahead, they would make rail shipments a specialty, as such a system would enable them to sort their own lumber, and would secure to them what good there was in the lumber, in place of shipping it by water as mill run, and allowing the middlemen to make the profit the manufacturer should receive on his own product.

"We are also convinced that such a system and policy will bring the consumer or contractor nearer the manufacturer; that it will in a great measure tend to abolish the yard or distributing-point system of the middlemen, hence bring the customer where he should come—to the producer.

"Am happy to say that the Flint & Pere Marquette Railway Company are prepared to transport lumber, lath, shingles and staves to Buffalo, Albany, New York, Philadelphia, Baltimore, Boston, Portland, Providence, Bridgeport, New Haven, Springfield, Worcester, Lowell, Williamantic, Norwich, and other important lumber points, at a rate guaranteed good until Oct. 31 next, and will guarantee a rate good from Nov. 1 next until April 1, 1880.

"Below are rates guaranteed until Oct. 31 next from Saginaw Valley points via the following fast freight lines:

"Red Line, Blue Line, Empire Line, Erie & North Shore Dispatch Line, Rhinebeck Line, National Dispatch Line, Saginaw Valley Line, Canada Southern Line, Great Eastern Line, Hoosac Tunnel Line, Baltimore & Ohio Line, Flint & Pere Marquette L. S. Line.

	Per car 10 tons.
To Buffalo.....	\$28
" Albany.....	48
" Baltimore, and points to which Baltimore rate is quoted.	47
" Philadelphia, and points to which Philadelphia rate is quoted.....	49
" New York and Stations on Hudson River Railroad.....	53
" Jersey City, Newark, Paterson, Passaic, Piermont, Carbondale and Newburgh on Erie Railway.....	53
" Boston, Portland, Providence, Bridgeport, Worcester, Springfield, Norwich, New Haven, Williamantic, Amherst, and points to which Boston rate is quoted, except to local non-competing points on Central Vermont Railroad and points on New London Northern Railroad via Great Eastern and National Dispatch lines.....	63
" Local non-competing points on Central Vermont Railroad and points on New London Northern Railroad from Miller's Falls to Palmer inclusive, via Great Eastern and National Dispatch lines.....	73
" Points on New London Northern Railroad south of Palmer to and including New London, via Great Eastern and National Dispatch lines.....	78

Colorado Passenger Rates.

A joint circular from the Atchison, Topeka & Santa Fe, Kansas Pacific and Union Pacific companies announces that Colorado rates are to be established and maintained hereafter. Agents are notified that, from April 15, the following rules will be observed:

"First. All tickets reading over the Union Pacific or Kansas Pacific roads, to points south of Denver, on the Denver & Rio Grande Railroad, must be withdrawn from sale. No tickets to points south of Denver will be exchanged or redeemed by the Kansas Pacific or Union Pacific companies after April 30, 1879.

"Second. All tickets via the Atchison, Topeka & Santa Fe Railroad to points north of Denver on the Denver Pacific and Colorado Central roads must be withdrawn from sale, and all tickets sold after the above date via the Atchison, Topeka & Santa Fe line to Colorado Springs and Denver, or any points via Denver, must be limited to a continuous passage from Atchison, Kansas City, or any junction point to destination; and such tickets must be signed by passengers and made non-transferable."

Rates are established as follows, all emigrant tickets being limited, and first-class to Denver by Union Pacific and by the Atchison, Topeka & Santa Fe being also limited:

Atchison to	First-class.	Emigrant.
Denver.....	\$27	\$20
Colorado Springs.....	27	20
Pueblo.....	27	20
Canon City.....	31	22
Leadville.....	41	34

These rates are fixed as the proportions to be reported to the lines west of the Missouri River points named (Omaha, Kansas City, Leavenworth and Atchison), regardless of where the business may originate, or at what through rate it may be carried.

RAILROAD LAW.

Stock Subscriptions in Ohio.

In Jewett against the Valley Railroad Company, the Ohio Supreme Court lately held as follows:

1. When 10 per cent. of the capital stock of a railroad company has been subscribed, and the corporation has been fully organized under the general acts relating to railroad companies, assessments on subscription to the capital stock may be made and enforced, although the whole amount of such stock mentioned in the certificate of incorporation may not have been subscribed.

2. If a statute in force at the time a subscription to the capital stock of a railroad company is made authorizes an extension of the line of the road, the subsequent exercise of such power by the company will not affect the subscription.

3. Where a railroad company changes a terminus of its road from one county into an adjoining county, under the act of 1873, the mere fact that the route to the new terminus selected by the company passes through a portion of a third county will not invalidate existing subscriptions to the capital stock.

4. Where one having possession of an agreement to take shares in the capital stock of a corporation, after subscribing in good faith for shares of such stock, induces others to subscribe on the faith of his subscription, and subsequently, without the knowledge of the other subscribers, alters the paper by reducing the number of his shares, and delivers the instrument in that condition to the secretary, who is also a director of the company, this will not affect the liability of one thus induced to subscribe, although at the time of such delivery the person making the alteration explains the same to the secretary, who makes no objection thereto.

THE SCRAP HEAP.

Railroad Equipment Notes.

The Lehigh Car Manufacturing Co., has added a bolt mill to its works at Stenton, Pa.

John L. Gill, at Columbus, O., is building 200 box cars for the Scioto Valley, and 500 for the New York, Lake Erie & Western. He has just completed 200 coal cars for the Columbus & Hocking Valley, and a special train of 22 cars for Sells Brothers' circus. This train included a sleeping-car for the proprietors and their families; a bunk-car to carry 96 men; five cars for horses; two for elephants, and 11 gondolas for carrying wagons, arranged with bridges at the ends, so that a wagon can be drawn over all the cars. The shortest car is 42 ft. long. There was also a complete and handsomely painted advertising car, to carry the advance agent and seven men, with bill-posting tools, etc.

The Baldwin Locomotive Works, Philadelphia, are running 14 hours a day, with 2,000 hands employed.

The Manchester (N. H.) Locomotive Works are building an engine for the Edgar Thomson Steel Works.

The Standard Steel Works, Philadelphia, shipped 1,000 steel locomotive tires in February, the largest shipments ever made in one month. They are full of orders.

The Pennsylvania Railroad shops, at Altoona, Pa., have 25 new engines under way.

H. K. Porter & Co., at Pittsburgh, are building a heavy shifting engine for the Lucy Furnace, Pittsburgh.

The foundry of the Taylor Iron Works, at High Bridge, N. J., which was burned down March 21, was so quickly rebuilt that it was in use and a lot of car wheels were cast on April 12. The works are now running full time, with a full force.

It is reported that negotiations are in progress for the removal of a locomotive shop, now established in Massachusetts, to Chattanooga, Tenn. Parties interested are about to visit Chattanooga.

The Brooks Locomotive Works, at Dunkirk, N. Y., have lately increased their force, and have several orders on hand.

Iron and Manufacturing Notes.

The quarterly statement of the Iron Age as to the condition of the blast-furnaces of the United States on April 1 is as follows:

	In blast.	Out of blast.	Not reported.	Total.
Charcoal.....	68	191	5	264
Anthracite.....	89	137	4	230
Bituminous or coke.....	84	135	—	219
Total.....	241	463	9	713
Total, April 1, 1878.....	232	458	—	690
Total, April 1, 1877.....	238	488	—	726

The total weekly capacity of the 241 furnaces in blast is 51,473 tons; out of blast, 68,945 tons. Average per furnace in blast, 213½ tons; out of blast, 149 tons. This would indicate that the older and smaller furnaces form the largest proportion of those out of blast.

The Missouri Furnace Co., at South St. Louis (Carondelet) is running two stacks of its own and one leased from the South St. Louis Iron Co.

The Gaylord Rolling Mill, at Portsmouth, O., has been re-organized, and it is proposed to add a steel mill.

The Black Diamond Steel Works of Park, Brothers & Co., Pittsburgh, are running full double turn.

The Thomas Iron Co., at Hokendauqua, Pa., have put an additional stack in blast.

The Erie City (Pa.) Iron Works have taken orders for 140 boilers since Jan. 1.

The St. Albans (Vt.) Iron & Steel Works stockholders, have approved the compromise with the creditors and re-elected the old officers.

The Albany & Rensselaer Steel & Iron Co., is running its Bessemer steel works in Troy, N. Y., to their full capacity, making about 1,800 tons of ingots a week. The company has large orders for steel rails for the Central Pacific and other roads.

The Roane Iron Works, at Chattanooga, Tenn., are making the rails for the new Nashville & Tusculosa road.

The Mount Carbon (Pa.) Rolling Mill was destroyed by fire on the night of April 24. It had not been run for several years and was in the hands of the bondholders.

Mr. Edward R. Andrews, proprietor of the Hayford Croco-soting Works at Elizabethtown, N. J., has taken a contract to croco-sote 5,000 yellow pine ties for the Central Railroad of New Jersey. This road laid in its main line in 1875 10,000 ties of the same kind of wood croco-soted, and it is re-

ported that these ties show no signs of decay, and although the whole traffic of the road has passed over them, they are not in the least worn by the rail, and are in better condition than white oak ties laid in the same line at the same time.

The property of the Joliet Iron & Steel Co. is to be sold in Chicago, May 24, under a deed of trust to the Farmers' Loan & Trust Co., of New York, dated Aug. 1, 1873, under which \$542,000 bonds are outstanding. The sale will be made subject to a prior mortgage to Moses Taylor, of New York, dated Aug. 1, 1871.

The Nova Scotia Forge Co., at New Glasgow, N. S., makes ship-knees, car-axes and railroad forgings, and has in its works four steam-hammers, three furnaces and eight forges, besides machine tools. Capacity of works, 2,000 tons a year.

Mr. Lenox Smith, C. E., is now selling agent for the steel rails of the Cambria Iron Co. and the Edgar Thomson Steel Co. His office is at No. 46 Pine street, New York.

The Betts Machine Co. has succeeded to the business of E. & A. Betts, of Wilmington, Del., the change taking place March 1. The company has bought the entire stock of machine-tool patterns, etc., of the old New York Steam-Engine Co., formerly of Passaic, N. J.

Bridge Notes.

The New Jersey Steel & Iron Co., at Trenton, N. J., has been awarded the contract for the floor beams of the new government printing office at Washington, at \$2.30 per hundred-weight.

The Keystone Bridge Co., of Pittsburgh, has received the contract for the iron-work of the Universal Exhibition building in the city of Mexico. About 3,000 tons of iron will be required.

Morison, Field & Co., engineers and bridge-builders, on May 1 removed their office from Buffalo to No. 52 Wall street, New York City. They report business very good, having now under contract 3,100 lineal feet of bridging.

Prices of Rails.

Steel rails are unchanged, with little new business. Early deliveries to new buyers are hardly possible, the mills being all full of work, and some concessions have been made for future deliveries.

For iron rails the demand is active, but many buyers wish to pay in bonds, which the mills are not willing to take. Most of them have orders on hand and are not willing to run risks. Quotations continue \$34 to \$35.50 per ton at mill.

In old rails sales are reported of several thousand tons to be delivered at Harrisburg, Pa., at \$21.50 per ton, and 2,000 tons delivered at Northumberland, Pa., at the same price. Philadelphia business light, at \$22 per ton.

Frogs.

A Tennessee jury lately called on to appraise the value of a certain red cow killed on the railroad, put it at \$25 if paid without trouble, or \$30 if the company makes trouble. Five dollars is certainly not a heavy charge for any trouble the company might make.

The sheet-anchor of a suburban traveler is a late train. The company may run trains every 15 minutes at the time he wants to travel; he may not use the late train once in two years, but unless there is a train from the city at midnight or thereabouts, he is not satisfied.

An exchange thinks that a cubic foot of second-hand breath, mixed with two cubic feet of tobacco smoke makes pretty fair ferry-boat atmosphere in the neighborhood of New York.

A red-hot stove on a warm morning and no fire in the car when the air is sharp and chilly is the rule about this time of year. The average brakeman don't own a thermometer.

How they Travel in Hungary.

A traveler who recently went by railroad from Kaschau to Eperies in Hungary, relates in the Vienna *Neue Freie Presse* the following incident of his journey: "When about a mile from Kaschau, the train suddenly stopped on the open road. The passengers threw open the windows, the locomotive shrieked, the brakeman sprang from the train—everybody thought an accident had happened. What was it? A fat and frisky little pig had escaped from one of the cars and was galloping wildly over the cross-ties. Now began an exciting chase. The frightened pig took to the fields, the drover after him, while the brakemen looked idly on and patiently awaited the capture of the pig. The chase continuing for a considerable time, the brakeman and finally the engineer took a hand in it, the train meanwhile remaining stationary on the main line. Having been unsuccessful, the engineer and brakemen returned one by one to the train—all but one brakeman who carried the baggage check-book. After waiting a while for him the engineer concluded to leave him and the lost pig behind, and the train was again put in motion. Arrived at Eperies the passengers demanded their baggage, but were informed that it could not be delivered, as the man with the baggage-book would not be there until the arrival of the next train, and there remained nothing to be done but patiently to wait his coming. That is the way they travel in Hungary."

The Thompson & Bachelder Brake Patent.

This afternoon Thomas Sayles of New York, through C. P. Jacobs, solicitor, brought suit in the United States Court against the Grand Rapids & Indiana, Indianapolis, Peru & Chicago, Indianapolis & Vincennes, Jeffersonville, Madison & Indianapolis, and Evansville, Terre Haute & Chicago railroads for damages by the use of a car brake alleged to be an infringement of a patent issued to Lafayette F. Thompson and Asahel G. Bachelder, of Massachusetts, in the year 1852.—*Indianapolis News*, April 24.

Tramps.

When one of the freight cars run into the Union Depot the other day was unlocked, out walked a tramp who had been locked in at Chicago. He looked as rumpled as a man who had been rolled down hill in a barrel, and as he limped off one of the employes called out: "Here! I want to see you a minute!" "Can't stop," replied the man as he hurried on. "My rule is to go right to a first-class hotel as soon as I arrive in town, and I can't make Detroit an exception."—*Detroit Free Press*.

An Engine on Fire.

Friday afternoon while the train on the eastern division of the Carolina Central Railroad was on its trip from Wilmington to Charlotte, a most unusual occurrence befell it. Stopping at a certain point, the tender was filled with dry pine wood, and six miles further on the whole mass of wood was discovered by Engineer Cook to be in a bright blaze. The material was so very inflammable that before the train could be stopped the flames had taken hold on the box-car next the engine. As quickly as this could be done the engine was uncoupled from the train, and leaving Conductor Everett, the train hands and passengers to fight the fire on the box-car, the engineer, in the intense heat generated by the burning pine, stood at his throttle and ran the engine three hundred yards up the road to a point where he knew he would find a pool of water on the road side. By the time he had

made this distance, the engine looked to the passengers in the rear like a sheet of flame; the engineer's clothes were scorched, his flesh blistered and the rosin drawn from the cab over his head; but with buckets of water carried by the fireman and wood-passer, Mr. Cook finally extinguished the flames, throwing the wood overboard as fast as he could put out the fire on it. By the time it was all over the water in the tender was hot almost to the boiling point, but for all that no damage had been done, the party behind having in the meantime extinguished the fire on the box-car.—*Charlotte (N. C.) Observer*, April 27.

A Fight on an Engine.

Last Monday evening passenger train No. —, on the Missouri, Kansas & Texas Railroad, came rattling up the valley between Parsons and Emporia, with Dave Dunham at the throttle and Johnnie Haley at the furnace, just as it has every evening for the past six years.

As engineer and fireman these two boys have stood side by side on this run since the spring of 1873, and have not only registered "on time," but have, by their strict attention to the road, gained the confidence of their employers and the friendship of many people living along this division of the Missouri, Kansas & Texas. (They have been the best of friends—a kind of friendship that danger cements and makes stronger has held them together for years—and but for the altercation giving rise to this item, they might have filled their respective stations for a life-time, and their names never appeared in the newspaper prints.) As the train pulled out from the low land on the Neosho and struck the prairie, the conductor noticed a sudden change in speed, but thinking the boys might be "lifting" her a little to meet the grade, paid no attention to it. The grade was met and passed as though no grade was there, and then down the hill she started at a terrible rate. As she skinned along the passengers began to show signs of nervousness as they saw farm houses rushing along as close together, apparently as in a Kansas town, and the conductor too began to think all was not right at the "steam end." As the speed increased at every revolution of the wheels, cushions, lunch baskets, bundles and babies flew around the car like mad, and now the thoroughly frightened passengers appealed to the conductor to stop the train. By this time he realized the danger himself, and knowing that a Santa Fe freight train had the "right of way" at the Emporia Junction, and that it would be certain death to reach there ahead of time, he jerked the bell-ropes as though a town were on fire. The bell sounded the alarm, but as no response came from the whistle, he realized for the first time that he was on a runaway train, five coaches from the engine. Whether it was the small amount of his life insurance policy, or the safety of the passengers that spurred him on, will remain an open question, but it is morally certain that he was not many seconds in passing through the coaches, scaling the iron rail of the mail car, and landing on the coal pile near the locomotive, which was writhing under the pressure of 65 lbs. more of steam than was necessary for celerity, comfort or convenience.

He says that as he struck the water-tank and rolled down into the cab, the engine was going so fast that the telegraph poles along the road looked a "picket fence." It took but a moment to put on the air brakes, reverse the lever and slow her down and find himself within two hundred yards of an open switch at the Santa Fe crossing, and that the run of eight miles had been made in less than eight minutes. When the train stopped the fireman jumped from the engine and ran down the track toward the city, and the engineer, arising from the floor of the cab, explained that just as they neared the Neosho grade, Haley, the fireman, accused him of having reported something discreditable to him to the division superintendent. This he stoutly denied, whereupon Haley assaulted him with a coal pick, and a hand-to-hand scuffle ensued. In the melee the throttle was thrown open, and going at the rate of a mile a minute, they "fought it out on that line."

On leaving the train Haley ran down to the court house, and had Sheriff Moon lock him up in a cell, fearing that he would be overtaken, he said, and killed by Dunham and his friends. Dunham was conveyed in a carriage to a physician and had his wound dressed. His face, head and shoulders were terribly cut and bruised, the cut in the back of the head by a pick being a very severe one.

The conductor ran the train through to Junction City, leaving his engineer in the hands of a nurse and his fireman in the hands of the sheriff.—*Topeka (Kan.) Commonwealth*, April 16.

A Pretty Story.

Since Thursday of last week, a beautiful white dove of the tumbler variety has followed Conductor Smith's freight train on the Old Colony Railroad daily from Walpole to a certain spot in Medfield, where it alights on a particular barn, reappearing next day at the same place in Walpole. During a part of the way the dove flies just back of the cab, under the pillar of smoke, and within a few feet of the engineer, and a part of the way beside the engineer's window and within two feet of his hand as he stretches it toward her. Occasionally she falls back to the rear of the train, as if surveying it, but only to resume her wonted place a moment later. The engineer has tried several times to run away from the bird by putting on extra steam, but to no purpose, as she seems to have the wings of the wind. When the train passes under a bridge the dove mounts gracefully above it, and tumbling immediately to its place again on the other side. Mr. Warren Cutting, the engineer, seems to be the favorite of this strange visitant.—*Boston Advertiser*, April 18.

The Quality of American and English Steel Rails.

Mr. W. A. Sweet, of Syracuse, N. Y., has written to the New York *Tribune* a letter in which he says: "That the English rails are better for wear than those made in America there is no doubt, and such being the fact, what is the reason? There is no use wasting words by saying it is not so, unless you are ready to prove it by actual fact. Set them before such men as Mr. Vanderbilt. I have no hesitancy in saying that I am better qualified to give an honest opinion of the quality of Bessemer by practice than any other man in America. I have manipulated by the ton all the kinds of Bessemer steel rails and have been a user of old steel for ten years, and during that time I have worked up the rail ends and old rails of nearly all the English and American steel rail makers. By careful and close observation I am sure that there is no chemical reason why the American steel rails are not as good as the English, but in a mechanical way the English are better for wear, and that is what Mr. Vanderbilt wants. This superiority of wear is not the result of any known reason on the part of the English makers, but from an actual unpremeditated and unstudied fact—simply this, they roll the rail colder when they finish it. This I have told to nearly all the rail-makers in this country, and they heeded it not. Now they have the fact brought to them in such a way that they must heed it. I have never heard of this idea being promulgated until within a few months, and then by Mr. Dudley, of the Pennsylvania Railroad. Your readers will ask why the English roll their rails colder, and I answer for the simple reason that they use a two-high train of rolls, and they cannot get out a rail as hot as they do in this country. I have argued for at least six years that Bessemer steel is not well and properly manipu-

lated for any such wear unless rolled cold enough to set the scale. All steel-rollers know well what this term means. Were I a steel rail maker I would use for the last three passes a polished chilled roll, and roll so cold that the rail would look smooth and well polished. This would put the steel in proper condition to wear, and were I a railroad manager I would not ask a guarantee of twelve years, but a guarantee of so many thousand wheels' tonnage, and I would not have any rails laid down under my management unless they were rolled as I have herein specified."

OLD AND NEW ROADS.

Atlantic & Great Western.—A dispatch from London says: "The McHenry party have issued a scheme for reconstructing the Atlantic & Great Western Railroad without foreclosure or lease to the Erie Company. The circular embodies a requisition to Sir Henry Tyler, Sir Charles Young and Captain Douglas Galton to act as a committee for carrying out the scheme. The *Times*, in its financial article says: 'It is stated that these gentlemen will act if influentially requested to do so.' But at least one of them has declared that he would undertake the work only if requested by the united bondholders."

A cable dispatch from London, April 30, says: "Application was made to-day to Vice-Chancellor Bacon for an injunction to restrain Gen. Sir G. Balfour, Mr. Charles Lewis and another person from carrying out a proposed lease of the Atlantic & Great Western Railroad to the Erie Railway Company. The main objection to the lease was that it might interfere with the reconstruction now going on with respect to the Atlantic & Great Western Railroad. His lordship said the matter was of some importance, and rather out of the ordinary course. He thought that, upon the affidavits which had been read, no harm would be done by his granting an injunction extending over Tuesday next, the plaintiff, Mr. McHenry giving an undertaking to be answerable in damages to the defendants."

A dispatch from Cleveland, O., April 20, says: "Judge Tibbals of the Court of Common Pleas of Summit County, O., has made the following important order in the suit of the Trustees against the Atlantic & Great Western Railroad Company and others, whereby the entire litigation between Gen. J. H. Devereux, the Receiver, and the United States Rolling Stock Company is taken from the courts. The contract of settlement is as follows, and is satisfactory to all parties. The Receiver shall pay the Rolling Stock Company on or before May 15, 1879, the sum of \$100,000 on account of claims. The Receiver further agrees to pay, from and after Jan. 18, 1880, not less than \$7,500 per month on certificates which have been issued to the Rolling Stock Company. The Rolling Stock Company, on its part, agrees to receive the stipulated payment in full settlement of all claims. The Receiver is authorized to borrow \$100,000 at 8 per cent. The whole amount claimed by the Rolling Stock Company was about \$300,000."

Atlantic & Gulf.—The recent severe storms in Georgia have done considerable damage to this road. The track was badly washed at the Withlacoochee and Suwannee crossings and at several points on the Albany Division. Three spans of the bridge over Big Satilla were carried away, and transfers are now made by a pontoon bridge. The repairs of the road were expected to require at least a week.

Brooklyn Rapid Transit.—The Rapid Transit Commission appointed under the general law for the city of Brooklyn, N. Y., has made a report to the effect that two elevated roads should be authorized in that city, one from Fulton Ferry through Fulton street and Fulton avenue to East New York; the other through Myrtle avenue to Broadway and through other streets; both roads to form connections with the East River Bridge when finished.

Brotherhood of Locomotive Engineers.—A dispatch from Clinton, Ia., April 28, says: "The Brotherhood of Locomotive Engineers of the Northwest held a largely-attended secret meeting at the Opera House at Cedar Rapids yesterday, special trains from Chicago and other directions having brought representatives from Chicago, Racine, Aurora, Keokuk, Boone, Davenport, Peoria, Ottumwa, Waterloo, Clinton, Marshalltown, St. Paul, and Minneapolis. The brotherhood was addressed by Grand Chief P. M. Arthur, of Cleveland, O. The object of the meeting is supposed to be a friendly gathering for mutual acquaintance."

Burgaw & Onslow.—Meetings are to be held to raise subscriptions for this road, which is to run from Burgaw, N. C., on the Wilmington & Weldon road, east by north to Jacksonville in Onslow County, a distance of about 30 miles.

Cairo & St. Louis.—The following order has been issued by General Manager Johnson of this road:

"Any employe known to be in the habit of intemperately using intoxicating drinks under any circumstances, or of frequenting saloons, and especially any who have been under the influence of liquor while on duty, will be considered disqualified for continuance in the service."

"Conductors, engineers, round-house and other foremen, failing to report any case of intoxication in their respective departments will be held guilty of very serious neglect of duty."

"Boarding-house and saloon-keepers are warned that their bills will not be collected if known to contain charges for liquor."

"I sincerely hope that the use of this destructive and expensive beverage will be avoided by all who desire to be considered efficient or meritorious men."

Canadian Pacific.—It is announced that a change in the line west of Winnipeg has been decided on. Instead of crossing the narrows of Lake Manitoba and running around the southern end of Lake Winnipegosis, the route around the southern end of Lake Manitoba has been adopted. The bridge over Red River at Selkirk is to be built this summer.

Central of Iowa.—A meeting of first-mortgage bondholders was held April 24, at the office of the Farmers' Loan and Trust Company, in New York. It was called by Russell Sage, F. D. Tappan, Morton Bliss & Co., James Buell, John J. Crane, Fred F. James, Edwin Parsons, Sumner R. Stone, N. A. Cowdrey, Frederic Leak and James G. Johnson.

The following resolution was unanimously adopted: "Resolved, That Messrs. Russell Sage, F. D. Tappan and Edwin Parsons, of New York; F. L. Ames, of Boston; Henry A. Jones, of Portland; L. A. Crozier, of Philadelphia, and Sidney Shepherd, of New Haven, be, and they are hereby appointed a committee to confer with the New York and Boston Committee, and to endeavor to arrive at an amicable adjustment of the conflicting interests of the several classes of creditors of this railroad company. That said committee be authorized and requested to do any and all things which they deem to be for the best interest of the bondholders."

The committee named above subsequently held a meeting and agreed that the following-named gentlemen should be submitted as a board of directors to the United States Circuit Court at Des Moines, before which tribunal the litigation against the road has been conducted: D. V. Rogers, of

Utica; Isaac M. Cate, of Baltimore; A. L. Berdette, of Leominster, Mass.; Charles Alexander, of Boston; G. E. Taintor, Russell Sage, Elwood Parsons, F. D. Tappen, and James Buel, of New York; Henry A. Jones, of Portland, Oregon, and George Bliss, of New York.

Central Pacific.—A survey is to be made of the extension of this company's Northern road from its present terminus at Willows, Cal., northward up the Sacramento Valley to a junction with the Oregon Division at Tehama or Red Bluff. The distance is about 45 miles, and this extension will complete the Northern road. It will also make a line to San Francisco from the upper end of the Oregon Division, more direct than the existing one by Roseville and Sacramento.

Cheraw & Salisbury.—Efforts are being made to raise the money to complete this road from Cheraw, N. C., northward 25 miles, to Wadesboro, N. C., on the Carolina Central road. Nearly all the grading was done some time ago. The company is trying to sell \$160,000 in bonds to complete the road and buy equipment.

Chicago & Alton.—The first train crossed the bridge over the Missouri at Glasgow on April 27. The train carried several officers of the road on trip of inspection over the new line to Kansas City.

Chicago, Milwaukee & St. Paul.—In the Barnes suit against this company, the United States Circuit Court has given a decision. After reviewing the past litigation, the Court held that the first plea to the bill was valid, and the second invalid, or, in other words, that only those bondholders who, upon the organization of the old Milwaukee & Minnesota Company, did not voluntarily surrender their bonds and take stock in that company could derive the benefits of the present bill. The question yet to be decided is whether certain bondholders did not surrender their bonds under coercion.

The complainant was granted leave to file a replication to this plea that the case might go to a master for proof. By the decision bondholders have the right to show before the master whether they surrendered their bonds and the stock voluntarily, or under coercion, or such circumstances as would render the surrender nugatory.

The suit was begun to set aside the foreclosure by Barnes as trustee of a mortgage on the old La Crosse & Milwaukee road and to begin proceedings anew.

Chicago & Pacific.—It is stated that the bondholders, who have arranged to buy in this road at the foreclosure sale this week, intend to build the road through to a connection with the Western Union at Lanark, 32 miles west of the present terminus at Byron, Ill.

Cincinnati, Sandusky & Cleveland.—The Boston *Advertiser* says: "The suits which have been so long pending between this company on the one side and Rush R. Sloane on the other, have been amicably settled and withdrawn, and steps will soon be taken to discharge the Receiver and place the road again in the hands of the stockholders."

Cincinnati Southern.—Cincinnati dispatches state that the Trustees have decided to lease the road until its completion to a new Common Carrier Company, of which Mr. E. W. Woodward is to be President and W. H. Clement General Manager. The new company is to be allowed 7 per cent. on its stock, the balance of net earnings to be turned over to the Trustees. The form of lease will give the Trustees a general supervision of the business and the appointments of the principal officers will be subject to their approval. They will also have a voice in making rates and in all contracts with connecting roads.

Cleveland, Tuscarawas Valley & Wheeling.—It is stated that the consent of holders of all but a few thousand dollars of the bonds have given their consent to the issue of preferred bonds, for the purpose of completing the extension from Uhrichsville, O., to Wheeling, W. Va. It is expected that work will soon be resumed on the line.

Colorado Central.—This road is now worked directly by the Union Pacific as its Colorado Central Division.

Columbus, Chicago & Indiana Central.—Washington dispatches of April 28 say: "The great railroad case of the Pittsburgh, Cincinnati & St. Louis Railroad Company against the Columbus, Chicago & Indiana Central Railroad Company, which has been pending in the United States Circuit Court for the district of Indiana since last July, was decided by Judge Harlan, of that circuit, to-day. The case involved the validity and construction of the lease made by the Pan Handle road of the Columbus, Chicago & Indiana Central road from Columbus to Chicago. The lessee company and its guarantor, the Pennsylvania Railroad Company, contended that the lease was void under the laws of Indiana and Ohio, and also that the lessor company had not kept its covenant to arrange, provide for, adjust and classify its bonded indebtedness in the mode and to the extent set out in the lease. They claimed also that the lessee had been evicted by the decree in the Pullan case, ordering a sale of 27 miles of the leased lines, and by the foreclosure proceedings of Roosevelt and Fodick, trustees in the first consolidated mortgage. Mr. Justice Harlan held:

"First—That the lease was not in contravention of the statutes of Indiana or Ohio.

"Second—That neither the Pullan decree nor the proceedings in the suit of Roosevelt and Fodick constituted an eviction entitling the lessee company to rescission at this time of the contract of lease.

"Third—That the covenant of the lessor company to arrange, provide for, adjust and classify their bonded indebtedness to the extent agreed upon was not a condition precedent to the performance of the lessees' covenant to pay the stipulated rent, but it was a matter of substance, not of mere form. It was a material part of the consideration of the covenant to pay rent, and the lessee was entitled to have the lessor's covenant performed within a reasonable time, and that complainant was entitled to a decree which should compel performance. The Court gives the lessor company until the 1st of January next to make the adjustment and classification of its bonded indebtedness as stipulated in the amended lease, and in default thereof the complainant has leave on that day to move for a decree rescinding the contract of lease, and for a settlement of accounts upon such terms as may be equitable. What were the rights of mortgage bondholders against the lessee corporation and against the Pennsylvania Railroad Company independent of the question of rescission, the Court said, was not involved in this case, and no expression of opinion about it is made.

"With regard to the time when the accrued rental, amounting now to more than \$3,000,000, should be paid by the lessee, there was no decisive expression of opinion; but, at the request of counsel on both sides, Judge Harlan announced that he would hear further argument upon this point at Chicago on the 2d of June next. The Hon. Stanley Matthews, Governor Hendricks and John Scott represented the Pan Handle and Pennsylvania companies, and Judge Houdley, Senator McDonald and C. F. Southmayd the Columbus, Chicago & Indiana Central Railroad Company."

The committee, consisting of R. T. Wilson, Adrian Iselin and Wm. Whitewright, have called a meeting of first-mort-

gage bondholders, to be held in New York, May 15, "for the purpose of uniting in such measures as under the recent decision of Judge Harlan will be requisite for the due enforcement of the rights of the bondholders against the Pennsylvania Railroad Company under the lease now adjudged to be valid, including such a scaling down of the first-mortgage bonds as will be necessary to reduce the absolute mortgage indebtedness to \$15,821,000, bearing 7 per cent. interest, and proposing to the second-mortgage bondholders the exchange, under a fair and equitable arrangement, of their bonds for income bonds now deposited in trust, or taking the necessary measures for cutting off the second-mortgage bonds by foreclosure if they do not agree to such arrangement."

Dayton & Southeastern.—Mr. F. Sprague, Auditor to the Receiver, reports as follows:

Earnings from Aug. 1, 1878 to March 1, 1879	\$53,989.76
Earnings for March	8,486.86
Total	\$62,476.62
Expenses (64.5 per cent.)	\$40,227.70
Betterments and new equipment	11,489.83
Surplus, April 1	\$10,758.89

Expenses for March were \$6,256.64, or 73.7 per cent. of gross earnings. The road is showing a steady growth in its business and earnings. The chief items of betterments were ballasting and additional siding. Amount paid for new cars and on car contracts was \$6,348.90 since the receivership began.

Detroit, Lansing & Northern.—Surveys have been begun for the extension of the Stanton Branch from Blanchard, Mich., to Big Rapids, and it is said that work will be begun as soon as the line is located.

Fond du Lac, Amboy & Peoria.—In the suit of Wellman against this company the Court has decided that George H. Wellman has a valid claim for \$110,000 for work done and materials furnished in the construction of the road. The company is to issue \$120,000 bonds to be secured by a mortgage on the completed road from Fond du Lac, Wis., to Iron Ridge, and upon the delivery of \$110,000 of these bonds to Mr. Wellman the Receiver will be discharged and possession of the road delivered to the company. The remaining \$10,000 bonds the company is allowed to use for its own benefit.

Grand Trunk and the Great Western.—The Toronto *Globe* has the following special dispatch from London, England, April 29: "The meetings of the Grand Trunk and Great Western Railway Companies, of Canada, were held to-day simultaneously. The attendance at each, consequently, was smaller than usual. Sir Henry Tyler, President of the Grand Trunk Railway, advocated amalgamation. He said such a course appeared more than ever desirable at the present time. He pointed out the advantage that would result from the two companies uniting their forces, if only for the purpose of resisting the hostile action and injurious influences of the Grand Trunk's late ally. The Grand Trunk line had long been anxious to bring about an identity of interests and a unity of action between the two companies. The Hon. Mr. Childers, of the Great Western Line, opposed the idea of amalgamation. Both meetings were quiet, and the reports were unanimously adopted. Sir Henry Tyler will sail for Canada on Saturday next, where he will remain for two months. The Hon. Mr. Childers will also leave here for Canada soon."

International & Great Northern.—Notice is given that the Farmers' Loan & Trust Company, in New York, will pay an amount equal to the 3 per cent. semi-annual interest on the new first-mortgage bonds to be issued under the plan of reorganization to all persons holding receipts or certificates for Houston & Great Northern and International first-mortgage bonds deposited with the Purchasing Committee.

Kansas Pacific.—The Committee of Denver Extension bondholders give notice that the sum of \$1,053,938.38, now deposited with the United States Trust Company, to pay arrangements of interest, cannot be paid out until holders of 4,000 bonds have signed the agreement. Bondholders are requested to sign at once, as a failure to do so will cause a delay of 30 days in the necessary legal proceedings.

Lafayette, Muncie & Bloomington.—The deed for this road was delivered on April 28 to the bondholders who bought it, the Court having confirmed the sale. The bondholders have organized the Muncie & State Line Company.

It is said that arrangements have been made to consolidate with the Lafayette, Bloomington & Mississippi Company, which is largely owned by the same parties, and whose road is an extension of this line.

Little Traverse.—A company has been organized to build a railroad from Little Traverse, Mich., to connect with the Grand Rapids & Indiana at Bay View. The distance is about five miles.

Lockport & Buffalo.—The track is now all laid on this road from the junction with the Erie at Tonawanda, N. Y., northeast to Lockport, and the first train ran over the road last week. It is 12 miles long, and was built to give Lockport a connection with the Erie.

Louisville & Nashville.—The not very probable rumor of a lease of this road to the Baltimore & Ohio is contradicted by authority.

A considerable movement in the stock is reported, some large purchases having been made recently, chiefly on New York and Eastern account. The object of these purchases is not known, but they are thought to be chiefly speculative.

President Standford is reported as speaking as follows to a representative of the Louisville *Courier-Journal*:

"There is nothing that has amused me so much lately as this rumor, of which I first learned yesterday. It is absurd; yes, more than that; it is ridiculous. Why should we sell? We believe we can make as much money for the stockholders as any foreign corporation can afford to pay them. The road is a home institution, believing in the prosperity of the people along its line as the greatest factor of its own prosperity, and no foreign corporation could administer to the good of all concerned as well as those on the ground, knowing all that should be done, and making direct efforts to accomplish the desired result. Our directors and officers have labored hard to make the road the equal of any in the land. We have advanced the physical condition of the road 50 per cent., increased its tonnage 25 to 30 per cent., decreased its fixed charges, made it yield \$800,000 annually more than it did in the fictitious ante-panic years, and now that we have brought it up to this high state of prosperity, that we should lose our senses and sell out is like tipping over the full pail of milk—a thing we will hardly do."

"The stock has for a long time been worth intrinsically more than its market value. Parties to whose attention this fact has been called, capitalists skilled in railway values, and seeking investments, upon investigation have found this to be true. They are men of sound sense, and the rapidity with which they have followed the dictates of their judg-

ment has surprised all save some few who wondered why the movement did not come earlier. The road now pays a 3 per cent. dividend on stock that has been selling from 35 to 55 cents on the dollar; and when money goes begging after 4 per cent. bonds selling at par, is it little wonder that our shares should be seized with avidity by those with capital to invest. * * * * *

"We have really no floating debt. Large amounts of money have been offered us at a very low rate of interest, and in some instances without any interest at all by Southern brokers for 30 and 60 days; but we have no use for it; do not need it, and cannot take advantage of this state of affairs."

Madeira & Mamore.—Cable dispatches last week announced that the English Courts had decided that the money raised in England years ago for this road and for some time past locked up in London awaiting action of the courts, could be used for the construction of the road. Later advices modify this somewhat, stating that the decision is only that the English holders of Bolivian government bonds are not entitled to receive the money. Further action will be needed to secure its use by the present contractors, although the present decision much improves their position.

Memphis, Paducah & Northern.—Work has been begun on the extension from Trimble, Tenn., to Covington, to connect the two finished sections of this road. The gap is 54 miles long; of which 34 miles were graded several years ago. This leaves only 20 miles of new grading, but a good deal of work is needed to put the old road-bed in condition. Track-laying has begun at Trimble, and the rails are expected to reach Newbern, eight miles, by the end of May.

Michigan Air Line.—It is reported that the Grand Trunk will at once build the extension of this road from Pontiac, Mich., to Lansing, 50 miles. From Lansing the Chicago & Lake Huron track will be used to Valparaiso, Ind., whence 26 miles more will be built to Thornton, Ill., to connect with the Chicago & Southern, thus completing a line for the Grand Trunk to Chicago.

Minnesota Railroad Extensions.—If existing plans are carried out, there will be a good deal of railroad built in Minnesota this year, chiefly by the old companies. Some of the projected extensions are as follows:

The *St. Paul & Pacific* will complete what is known as the Branch Line by building some 80 miles from Alexandria to Barnes. A branch 10 miles long from the St. Vincent Extension to Red River at Grand Forks will be built and a short spur to Red River at Elk River, from Smith Lake to Beaver Falls, and from Anoka to Princeton.

The *St. Paul & Sioux City* will, it is said, build the branch from Mankato to Blue Earth, about 40 miles, and will extend its Worthington & Sioux Falls Branch westward about 40 miles, with the intention of going 140 miles further into Dakota.

The *Southern Minnesota* has already decided to extend its road westward from Jackson to the Dakota line, about 85 miles, and the contract for a part of the work has been let.

The *Chicago, Milwaukee & St. Paul* will extend its Hastings & Dakota line from Montevideo west to Flandreau, about 70 miles. It will also build a new short line between Minneapolis and St. Paul.

The *Minneapolis & Northwestern* contemplates several narrow-gauge lines, but has done little or nothing as yet.

Montgomery & Eufaula.—At the bondholders' meeting last week it was resolved to buy in the road, as already noted, and also to sell it to the Louisville & Nashville Company at a valuation of \$1,400,000, for which the bondholders agree to accept the 6 per cent. bonds to be issued by the Louisville & Nashville and secured by Mortgage upon the Montgomery & Eufaula road. The new mortgage is at the rate of \$17,500 per mile, with an annual interest charge of \$1,050 per mile. This should be a very satisfactory bargain for the bondholders, who have received nothing for a long time. The road is 80 miles long, from Montgomery, Ala., east by south to Eufaula.

A suit has been begun in the United States Circuit Court in New York, by Benjamin G. Clarke, of New York, who holds \$51,000 of the bonds, and who seeks to prevent the execution of this agreement and the transfer of the road, and to enforce the execution of a prior agreement, dated June 27, 1877, under which a new company was to be organized and the road worked for the benefit of the bondholders. He charges that the trustees have abused their powers in order to secure a transfer of the road to the Louisville & Nashville, contrary to the true interest of the bondholders. The Court granted the usual temporary injunction pending trial of the case.

Nashville & Tuscaloosa.—Orders have been given to lay the track on this road as fast as the iron is delivered, and the work will soon be well under way. The grading is finished for 20 miles southward from the junction with the Nashville, Chattanooga & St. Louis at Dickson, Tenn.

New Jersey Midland.—The Committee of reorganization give notice that holders of first and second-mortgage bonds who desire to join with the Committee must deposit their bonds with the Central Trust Company in New York by June 2.

St. Louis & Southeastern.—Auditor Young's report for March is as follows:

	St. Louis Div.	Kentucky Div.	Tennessee Div.	Entire line.
Gross earnings	\$51,092.30	\$10,252.86	\$13,884.71	\$75,229.87
Expenses	36,458.53	23,014.63	9,693.20	70,006.45
Net earnings	\$15,233.77	\$6,338.23	\$4,191.42	\$25,763.42
Per cent. of exps.	70.52	78.93	69.74	73.14

As compared with March, 1878, the entire line shows an increase of \$2,826.46, or 3.0 per cent., in gross, and of \$1,112.55, or 4.9 per cent., in net earnings. The gain was on the Tennessee and Kentucky divisions, the St. Louis Division showing a slight decrease.

New York Elevated.—It is announced that this company and the Metropolitan Elevated have come to an agreement in relation to their East Side lines in New York. It was originally intended to use about half a mile of road in common, but it has been lately decided that this is impracticable, when each company is running over 400 trains a day. An agreement has therefore been made by which the Metropolitan road is to have exclusive possession of the road from Chatham square to the Battery, and the New York Company will run all its trains to and from the City Hall station, making the Chatham Street Branch its main line and the City Hall the down-town terminus. A system of transfers will be arranged by which passengers on either road can change to the other at Chatham square without extra charge.

This agreement has given rise to reports that a consolidation of the two companies, in fact if not in form, is intended by their managers.

The Grand Jury has made a presentment as to the safety of the old line of the New York Elevated on Greenwich street and Ninth avenue, and requested that it be examined by competent engineers. The company, however, has already made contracts to replace this track with a new structure.

New York & New England.—The bill repealing the authority given to the Governor to sell the state stock in this company has passed both houses of the Massachusetts Legislature and has been signed by the Governor.

Old Colony.—The trial of Hartwell, the freight conductor, whose neglect to send out signals is believed to have caused the Wollaston accident, resulted in a verdict of guilty of manslaughter, as charged in the indictment. The Court instructed the jury that they must consider the printed rules of the road, and whether the defendant complied with them or not, in determining his responsibility. Exceptions were filed by Hartwell's counsel, and the case will be taken to the Supreme Court.

Oregon Central.—Contracts have been let for the grading of an extension of 10 miles from St. Joseph, Or., the present terminus, to Amity, in Yamhill County. The road is to be finished this summer.

Pennsylvania.—This company's statement for March shows for all lines east of Pittsburgh and Erie, as compared with March, 1878:

An increase in gross earnings of	\$103,782
An increase in expenses of	84,397
Net increase	\$19,385

For the three months ending March 31 the same lines show, as compared with the corresponding period in 1878:

An increase in gross earnings of	\$626,040
An increase in expenses of	37,237
Net increase	\$588,803

All lines west of Pittsburgh for the three months of 1879 show a surplus over all liabilities of \$303,098, being a gain of \$77,746 over the corresponding period in 1878.

The Philadelphia *Times*, of April 24, says: "The litigation growing out of the efforts of the Baltimore & Ohio Railroad Company to get a through connection to New York by obtaining a quick transportation over the Junction Railroad in this city has been extended. A short time ago a bill in equity was filed by Lathrop and others to the end that the managers of the Junction Railroad Company furnish motive power to all corporations and railroads desiring transportation over its road. Yesterday similar bills were filed in the United States Circuit Court by the Baltimore & Ohio Railroad and the Central Railroad of New Jersey. These, like the former, are directed against the Pennsylvania Railroad, which is joined as a co-defendant with the Junction Railroad. The complainants in the various bills allege that the Junction Railroad Company have refused to ship the freight of the Baltimore & Ohio road, and have also refused to furnish the motive power to the Baltimore & Ohio for such transportation. It is claimed that the Pennsylvania Railroad Company, being a rival line, has prompted this refusal, and an injunction was asked that the Junction Railroad Company furnish motive power required, and make such transportation. The bill further alleges that the Pennsylvania Railroad Company claims that the track lying between Market street and Haverford street is not the property of the Junction Railroad, but its property. In answer to this it is urged that the proposed route of the Junction Railroad Company was over this ground, and that the track had been operated in the interests of the Junction Railroad. The question of the preliminary injunction will be argued in the course of a week or so, before Judge McKenna, at Pittsburgh."

A contract for the new line at Valley Creek, east of Downingtown, Pa., has been let to Wm. S. Nead. The new line will be 5½ miles long, and will avoid several sharp curves in the old line.

Philadelphia & Reading.—This company's statement for March and the four months of its fiscal year ending March 31 is as follows:

	March, 1879.	March, 1878.	Four months, 1879.	Four months, 1878.
Gross earnings	\$889,570	\$658,991	\$3,426,097	\$2,958,433
Railroad traffic	75,864	2,087	84,864	19,795
Canal traffic	69,647	27,906	226,497	196,273
Steam coilers	6,001	6,350	29,430	24,227
Richmond barges				
Total R. R. Co.	\$1,041,142	\$695,334	\$3,757,878	\$3,198,728
Coal & Iron Co.	753,179	312,178	2,311,271	1,791,241
Total	\$1,794,321	\$1,007,512	\$6,069,149	\$4,989,969
Traffic:				
Passengers carried	510,792	480,114	1,937,880	1,942,797
Tons merchandise	391,701	284,838	1,024,080	600,633
Tons coal on road	600,493	229,260	1,944,362	1,281,772
Tons coal on coilers	56,236	30,275	178,586	171,893
Tons coal mined:				
By Coal & Iron Co.	323,378	89,324	1,005,614	613,769
By tenants	97,991	42,193	326,445	215,328
Total	421,069	131,519	1,332,059	829,097

For the month the receipts of the railroad company show an increase of \$345,808, or 49.8 per cent., and those of both companies an increase of \$786,809, or 78.1 per cent. For the four months the railroad company's earnings increased \$559,150, or 17.5 per cent., and those of both companies gained \$1,079,180, or 21.6 per cent. The gains were due to the great increase in coal tonnage.

Pittsburgh & Castle Shannon.—In the United States District Court in Pittsburgh, April 25, application was made by the Fifth National Bank and others for the appointment of a receiver. Plaintiff charged bad management and purchases of coal lands injudiciously made. The bank holds \$125,000 first-mortgage bonds, and is also interested in the floating debt. A part of the road has been levied by the Sheriff, and it is necessary to take some action at once.

After hearing full arguments the Court decided to grant the order, and appointed W. W. Martin Receiver.

Pittsburgh, New Castle & Lake Erie.—Work has been begun on the extension of five miles from Etna, Pa., the present terminus, to Allegheny City. It is to be finished in 60 days. Tracklaying was begun this week on the extension from Zelenople, Pa., to Wurttemberg.

Pittsburgh Southern.—The Court of Common Pleas at Washington, Pa., has confirmed the sale of this road to James H. Hopkins, some objections made by other creditors being set aside.

The creditors and stockholders of the company have raised a considerable amount to meet the proposition made by Mr. Hopkins, and most of them will join with him in organizing a new company. A meeting is to be held next week for the purpose of electing directors.

St. Louis, Iron Mountain & Southern.—The bridge over Red River at Fulton, Ark., was carried away, April 28, by a sudden freshet, in which the river rose 22 feet in a few hours. A large force was at once sent down to Fulton to put up a temporary bridge. It is expected that this will take two or three days, and in the meantime transfer is made by a ferry-boat.

Securities on the New York Stock Exchange.—The following securities have been placed on the lists at the New York Stock Exchange:

Boston & New York Air Line, preferred stock, \$2,249,500 in amount.

Mississippi River Bridge Co., first-mortgage bonds, \$700,000 in amount. They are a first-mortgage on the bridge, and also an obligation of the Chicago & Alton, which built and uses the bridge.

International & Great Northern, receipts of Farmers' Loan & Trust Company, for bonds deposited with the Purchasing Committee.

Sharpville & Lake Shore.—This company has been organized to build a railroad from Sharpville, Pa., through the Shenango and Pymatuning valleys to Kinsman, O., on the Mahoning Coal Branch of the Lake Shore & Michigan Southern. The distance is about 11 miles, and the road is intended to furnish an outlet to the Sharpville coal road, which is now dependent upon the Erie & Pittsburgh, with which the Sharpville Company has not been on good terms.

Union Telegraph Co.—This company has filed articles of incorporation in New York to build telegraph lines from that city to and through any state or territory in the United States. The capital stock is to be \$10,000,000. The incorporators are Jay Gould and David H. Bates, of New York; Charles A. Tinker, of Baltimore.

Vicksburg, Shreveport & Texas.—In the case of Jackson against Ludeling and others the United States Supreme Court affirms its former decision, reversing that of the lower court, and remanding the case for decrees in accordance with this decision.

In the case of Parsons and others, involving the validity of certain bonds stolen during the war and afterward sold in New York, the same court has affirmed the decree of the Circuit Court, holding that the purchasers had sufficient notice of suspicious circumstances attending the sale of the bonds, and were therefore not bona fide holders.

Wabash.—It is stated that this company has concluded a contract by which its Kansas City and St. Joseph business will be taken away from the Hannibal & St. Joseph and sent by the St. Louis, Kansas City & Northern between Kansas City and Moberly, Mo., and the Missouri, Kansas & Texas between Moberly and Hannibal. The distances by the new line are nearly the same, being 199 miles from Hannibal to Kansas City and 231 miles to St. Joseph, against 206 miles from Hannibal to St. Joseph and 236 to Kansas City by the Hannibal & St. Joseph.

The election of Mr. James F. Joy as a director of this company has given rise to a report that a branch or extension to Detroit is intended. Citizens of that place are already moving in the matter and a committee is to be appointed to confer with officers of the company. There are already two lines between Detroit and Toledo, one belonging to the Lake Shore, the other to the Canada Southern.

West Jersey.—This company is building a branch line about three miles long from Cape May City, N. J., to Cape May Point, which is now reached by horse-cars. It is to be finished in time for the coming summer's travel.

Wilmington & Northern.—Surveys have been made for a branch line about three miles long, from Springfield, in Chester County, Pa., to the Falls of French Creek. It is intended to reach some iron mines.

Wisconsin Central.—In the suit of Stern against this company, the United States Circuit Court has decided in favor of the company. The Court held that, if Stern had any equities requiring protection, he should have filed an intervening petition in the suit now pending by the trustees. Appearances were that the proceedings of the trustees had protected and actually improved the security of Stern and other bondholders.

Wisconsin Railroad Projects.—The Madison (Wis.) *State Journal* notes preparation for summer work in that state as follows:

"The Viroqua Railway was organized in May last, and during the fall months the road was built from a point two miles west of Sparta, on the St. Paul road, to Melvina, a distance of 10 miles from the Junction. Work will be renewed within a few days, and by the 1st of June the contractors expect to have the road completed to Viroqua.

"The St. Cloud, Grantsburg & Ashland Company was organized last June, to construct a road from Grantsburg, in Burnett County, to a point on the St. Paul & Duluth Railroad. Considerable grading was done last fall, and work will be resumed early this Spring.

"The North Wisconsin road will be extended, the present year, from Cumberland, in Barron County, 20 miles northward, which will carry it into the south part of Burnett County.

"The Milwaukee, Lake Shore & Western Company contemplates extending its road from Clintonville, northward some 30 miles, into Shawano County, but the line has not been definitely located.

"The Black River Railroad Company was organized last spring, to build a road from Merrillan, in Jackson County to Neillsville, in Clark County. Some work was done last summer, and the road will undoubtedly be built some time during the present season.

"The Chicago & Tomah road, was built from Woodman in Grant County to Lancaster, last fall. The same company has some 20 or 30 miles of grading on its road in Crawford and Vernon counties, and it will probably be ironed during the summer.

"The Illinois & Wisconsin Narrow Gauge company contemplates building a road from Phillips Corners, La Fayette County, to Avoca, in Iowa County. It is also a part of the general plan, we believe, to purchase the Galena & Southern Wisconsin road, which has not been operated since last June and is soon to be sold, and make it a part of the line.

"The Wisconsin Central company will extend its road from Portage to Merrimack, and from thence to Dubuque, if it can raise the money, which it is making every exertion to do, but success is not yet assured.

"Efforts are also being made in Oshkosh to secure a connection with the Central at Clayton and with the Green Bay & Minnesota at Hortonville. The people of Appleton also expect to secure a branch from the Central to that city.

"Rumors prevail that the Sheboygan & Fond du Lac is to be extended from Princeton to Westfield, but we can trace them to no reliable source. Like rumors were also circulated that the road was to be extended from Princeton to Portage and Okeo, in Columbia County.

"Interest is being revived in the Chicago, Portage & Superior road, and contractors are looking at it as a desirable field for investment. The most of the grading from Jefferson to Chicago, was done several years ago, but the company was obliged to suspend operations when the panic of 1873 overtook it.

"The Mineral Point road will make an effort to build its road to Dodgeville the present season, but success is probably contingent upon an agreement with the Central company to build so the same point.

"The Wisconsin Valley road was to have been extended from Wausau to Jenny this season, but the litigation which followed over the issue of Lincoln County bonds in its aid will defeat the project for the present. It is possible that the scheme will be renewed in a new form.

"The people of Milford and Lake Mills are making a strong effort to build a road from those points to Watertown, but no definite conclusion has been reached. "A spur from the Chicago, St. Paul & Minneapolis road will be built to Menominee this season, we learn."

ANNUAL REPORTS.

Mississippi & Tennessee.

This company owns a line from Memphis, Tenn., to Grenada, Miss., 100 miles. Its report is for the year ending Sept. 30, 1878.

The general account is as follows:

Stock (\$8,254 per mile)	\$825,400
Funded debt (\$19,829 per mile)	1,982,900
Floating debt	106,730
Earnings for year	378,780
Discount on Tennessee bonds	217,715
Total	\$3,511,525
Road and equipment (\$29,567 per mile)	\$2,956,654
Interest and expenses for year	377,879
Cash and assets	163,917
Profit and loss	13,075
	3,511,525

From the close of the previous year there is a decrease of \$171,814 in the funded debt, and an increase of \$31,532 in floating debt. The President says in his report: "The mortgage authorized by the stockholders on the 30th of July, 1877, was for the purpose of retiring the existing obligations of the company then covered by the first mortgage, being more than a year overdue, and to provide the means required for an extension to the river front and for constructing a union depot there. The debt due the state of Tennessee, being some \$300,000, has been settled, at an advantage to the company of over one-half that sum. All the first-mortgage bonds have been exchanged except \$34,000, withheld from no objection to the new bonds, but because the owners of the old bonds cannot just now control them. This, it is expected, they can soon do, and then the exchanges will be made. Every bond of the second mortgage has been exchanged."

The movement of cotton was, in bales, as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Through to Memphis	1,874	46,108	D. 4,542	9.9
Local to Memphis	30,092	57,977	L. 1,974	3.4
Through to New Orleans	50,951	8,080	D. 154	1.8
Local to New Orleans	8,532			
Total	110,049	112,771	D. 2,722	2.4

The earnings of the road for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Gross earnings	\$378,780	\$433,440	D. \$54,660	12.6
Expenses	201,840	220,672	D. 18,832	8.5
Net earnings	\$176,934	\$212,768	D. \$35,834	16.8
Gross earn. per mile	3.788	4.334	D. .546	12.6
Net	1.769	2.128	D. .359	16.8
Per cent. of exps.	53.29	50.91	L. 2.38	4.7

This great falling off in receipts is due to the universal depression of trade and a total suspension of business, for two months or more, during the yellow fever epidemic, along the whole line of the road.

There are now on hand eleven locomotive, eight of which are in running order and three in shops undergoing repairs. The motive power is not in a very good condition, many of the engines being old, and will require a heavy outlay in way of repairs. Two freight engines are needed before commencing next season's business.

Rome, Watertown & Ogdensburg.

This company owns a line from Rome, N. Y., to Ogdensburg, 141.11 miles, with branches to Cape Vincent, 34.24 miles; to Potsdam, 24.28 miles; to Syracuse, 44.50 miles, and from Oswego, N. Y., to Lewiston, 146.17 miles. It leases the Oswego & Rome road, from Richland to Oswego, 28.58 miles, making 380.30 miles owned and 408.88 worked. The following figures are published for the year ending Sept. 30, 1878.

The funded debt is \$7,749,900, or \$20,378 per mile, a heavy charge for a road which has so many miles of line with light earnings.

The traffic for the year was as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers carried	576,974	674,270	D. 97,296	14.4
Passenger mileage	15,190,509	17,549,628	D. 2,359,119	13.4
Tons freight carried	370,905	399,948	D. 29,043	7.6
Tonnage mileage	24,967,418	26,732,738	D. 1,765,320	6.1

The earnings for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers	\$443,398	\$480,102	D. \$36,704	7.6
Freight	656,046	682,828	D. 26,782	3.9
Mail, express, etc.	114,352	62,341	L. 52,011	23.8
Total	\$1,213,796	\$1,225,271	D. \$11,475	3.3
Expenses	863,039	912,134	D. 49,095	5.4
Net earnings	\$350,747	\$313,137	L. \$37,610	2.2
Gross earn. per mile	2.969	3.070	D. .101	3.3
Net	.858	.839	D. .019	2.2
Per cent. of expenses	71.10	72.96	D. 1.86	2.1

Payments other than for operating expenses were \$24,000 rental of Oswego & Rome road and \$417,285 interest; total, \$441,285, or \$90,538 more than the net earnings. Interest paid was \$125,208 less than that on the whole bonded debt. Interest on the consolidated bonds has been in default since April, 1878.

Natchez, Jackson & Columbus.

This company owns a line of 3 ft. 6 in. gauge from Natchez, Miss., to Martin, 43 miles. Of this 8½ miles, from Merriweather to Martin, were built during the year and opened in October. The following statements were for the year ending Dec. 31.

The chief freight is cotton, and there was carried for the year:

	1878.	1877.	Increase.	P. c.
Passengers	7,416	6,196	1,220	19.7
Bales cotton	8,521	5,402	3,059	56.0

The earnings for the year were as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Passengers	\$5,890.25	\$5,553.09	L. \$337.16	10.0
Freight	19,550.51	18,631.04	L. 919.47	4.9
Total	\$25,440.76	\$24,184.13	L. \$1,256.63	6.0
Expenses	15,019.44	12,986.05	L. 2,033.39	15.6
Net earnings	\$10,421.32	\$11,008.08	D. \$586.76	5.3
Gross earn. per mile	704.09	695.44	L. 8.65	1.2
Net	280.48	319.02	D. 38.54	9.2
Per cent. of expenses	59.04	54.11	L. 4.93	9.1

There was paid from net earnings for interest and other purposes \$10,809.83, leaving a deficit of \$388.51 for the year. Increased traffic is looked for as the road is extended.

Morris & Essex.

This company owns a line from Hoboken, N. J., to Phillipsburg, 84 miles, and the Boonton Branch, a loop line from Bergen Tunnel to Denville, 34 miles, making 118 miles owned. It leases the Newark & Bloomfield road, from Rossville to Montclair, 6 miles, and the Chester road, from Dover to Chester, 13 miles, making 137 miles worked. The whole property is leased to and worked by the Delaware, Lackawanna & Western Company. The following figures are from the report to the Comptroller of New Jersey for the year 1878.

The stock, debt, etc., at the close of the last two years were as follows:

	1878.	1877.	Inc. or Dec.
Stock.....	\$15,000,000.00	\$15,000,000.00	I. \$177,000.00
Bonded debt.....	19,923,000.00	19,740,000.00	I. \$183,000.00
Total.....	\$34,923,000.00	\$34,740,000.00	I. \$183,000.00
Less sundry assets.....	925,044.38	950,490.55	D. 25,446.17
Balance.....	\$33,997,955.62	\$33,789,509.45	I. \$208,446.17
Cost of road.....	17,710,790.81	17,551,083.02	I. 159,707.79
Equipment.....	12,144,240.13	12,140,592.13	I. 3,648.00
Hoboken docks etc.....	3,420,839.68	3,420,839.68	
Canal at Hoboken.....	713,085.00	673,994.62	I. 39,090.38

Total cost, \$33,997,955.62 \$33,789,509.45 I. \$208,446.17
The stock is \$127,119, and the bonds \$168,839 per mile of road. Cost of road is \$150,091 and equipment \$102,917 per mile owned; total cost, including terminal improvements, \$288,118 per mile owned, making it one of the most costly roads in the country.

The earnings for the year were as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Passengers.....	\$800,402.63	\$770,493.68	I. \$29,908.95	3.9
Freight.....	630,135.16	643,902.88	D. 13,767.72	0.7
Coal.....	1,070,449.79	1,729,436.15	D. 658,986.36	37.8
Other sources.....	104,129.13	224,618.34	D. 30,489.21	13.0
Total.....	\$2,615,116.71	\$3,368,441.05	D. \$753,324.34	19.5
Expenses.....	1,927,788.99	2,145,933.70	D. 218,144.71	10.2

Net earnings, \$787,327.72 \$1,222,507.35 D. \$440,179.63 36.0
Gross earn. per mile..... 10,781.95 24,587.16 D. 4,805.21 19.5
Net earn. per mile..... 5,710.42 8,923.41 D. 3,212.99 36.0
Per cent. of expenses..... 71.13 63.71 I. 7.42 11.6

The net earnings were 2.24 per cent. on the stock and bonds, or 2.30 per cent. on total cost of road. They were 3.93 per cent. on the bonded debt alone.

The rental paid by the lessee is interest on the bonds and 7 per cent. on the stock. Allowing interest for half the year on the increase in bonded debt, the rental would have been \$2,438,415, showing a net loss of \$1,656,087.28 to the lessee.

The loss in earnings was almost entirely on coal. No statement of payments other than for operating is made.

Delaware & Bound Brook.

This company owns a main line from the Central of New Jersey, near Bound Brook, N. J., to the Delaware River, 27 miles, with a branch to Trenton, 3.7 miles, making 30.7 miles in all. The main line forms a little less than one-third of the New Line between New York and Philadelphia. The following statements are from the report to the Comptroller of New Jersey for the year ending Dec. 31.

The stock and debt at the close of the last two years were as follows:

	1878.	1877.	Inc. or Dec.
Stock.....	\$15,000,000.00	\$15,000,000.00	
Bonded debt.....	1,500,000.00	1,500,000.00	
Floating debt.....	279,620.06	259,033.02	I. 20,587.04
Total.....	\$15,779,620.06	\$16,759,033.02	D. \$979,412.96
Cost of road and equipment.....	3,136,534.23	2,908,046.08	I. 228,488.15

The stock is \$49,316 and bonds \$48,860 per mile of road. Cost of road reported is \$102,167 per mile. The main line is all double track.

The earnings and expenses for the year were as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Passengers.....	\$137,390.97	\$122,438.01	I. \$14,952.96	12.1
Freight.....	132,131.16	115,138.83	I. 16,992.33	14.8
Other sources.....	1,145.88	889.99	I. 255.89	28.8
Total.....	\$270,577.01	\$238,466.83	I. \$32,110.18	13.5
Expenses.....	151,547.49	171,422.18	D. 19,874.69	11.6

Net earnings, \$119,029.52 \$67,044.65 I. \$51,977.87 77.6
Gross earnings per mile..... 8,813.36 7,767.65 I. 1,045.71 13.5
Net earnings per mile..... 3,870.96 2,183.86 I. 1,687.10 77.6
Per cent. of exps..... 55.01 71.89 D. 16.88 22.1

This shows for the road's second full year of working a very encouraging increase of business and especially of net earnings.

The annual interest charge on the bonds is \$105,000, leaving for 1878 a surplus of \$14,022.52. The net earnings in 1878 were 3.95 per cent. on the stock and bonds.

Panama.

This company owns a line across the Isthmus of Panama from Aspinwall to Panama, 47.5 miles. The company also owns steamers which run between its terminal ports and points in Central and South America. The following statements for the year ending Dec 31 were presented at the recent annual meeting:

The bonded debt is \$3,877,308, and the sinking fund amounts to \$731,945. The stock is \$7,000,000. Assets reported, other than the road, are \$1,195,346.38; liabilities, \$4,570.44, leaving a balance of assets of \$1,190,775.94, besides a claim of \$1,000,000 against the Pacific Mail Steamship Company.

The traffic for the year was as follows:

	1878.	1877.	Increase.	P. c.
Passengers carried.....	24,921	22,110	2,811	12.7
Tons freight carried.....	152,478	146,942	5,536	3.8

All or nearly all the business is through. The earnings for the year were as follows:

	1878.	1877.	Increase.	P. c.
Gross earnings.....	\$2,114,859.34	\$1,988,130.81	\$126,728.53	6.4
Expenses.....	545,344.26	456,979.25	88,365.01	19.3
Net earnings.....	\$1,569,515.08	\$1,531,151.56	\$38,363.52	2.5
Gross earn. per mile.....	44,523.35	41,855.30	2,668.05	6.4
Net earn. per mile.....	33,042.42	32,234.77	807.65	2.5
Per cent. of exps.....	25.70	32.90	7.20	12.2

Payments from net earnings were:

Net earnings.....	\$1,569,515.08
Interest.....	\$239,889.02
Subsidy to State of Colombia.....	250,000.00
Total.....	\$1,079,626.06

Net balance..... \$1,079,626.06
From this surplus four quarterly dividends of 3 per cent.

each were paid, making 12 per cent. in all. During the year 100 box cars were bought and charged to expenses. The freight equipment is now sufficient, but new passenger cars are needed, the old ones being of old style and not convenient.

Renewals with steel have been continued, and by the close of the current year the whole road will be laid with steel.

Southern Central.

This company owns a line from Fair Haven, N. Y., on Lake Ontario, southward to a connection with the Lehigh Valley road at the state line, near Sayre, Pa., 114 miles. Its statement is for the year ending Sept. 30, 1878. The general balance sheet is as follows:

Stock (\$15.704 per mile).....	\$1,790,234.94
Bonded debt (\$22.282 per mile).....	2,540,125.00
Bills payable, current accounts, etc.....	88,414.83
Total.....	\$4,418,774.77
Cost of road, equipment and real estate (\$37.905 per mile).....	4,287,010.87

The earnings for the year were as follows:

	1877-78.	1878-79.	Inc. or Dec.	P. c.
Passengers.....	\$78,850.16	\$88,815.13	D. \$9,964.97	11.2
Freight.....	336,120.12	373,049.00	I. 36,928.88	3.0
Express, mail, etc.....	47,936.36			
Total.....	\$402,906.64	\$461,864.73	I. \$58,958.09	0.2
Expenses.....	320,056.81	338,552.12	D. 18,495.31	5.5
Net earnings.....	\$142,850.33	\$123,312.61	D. \$19,537.72	15.8
Gross earn. per mile.....	4,060.58	4,051.45	I. 0.13	0.2
Net earn. per mile.....	1,253.07	1,081.79	I. 171.28	15.8
Per cent. of exps.....	69.14	73.30	D. 4.16	5.7

A considerable gain is shown in net earnings, due to the reduction in expenses. Payments are reported of \$126,102.33, leaving a balance of \$16,748 for the year.

Rock Island & Peoria.

This company is successor, through foreclosure, to the Peoria & Rock Island, and owns a line 91 miles long from Peoria, Ill., to Rock Island. Its statement is for the year ending Dec. 31, 1878.

The balance sheet is as follows:

Stock (\$16.484 per mile).....	\$1,500,000.00
Bonds (\$1.648 per mile).....	150,000.00
Current accounts.....	21,573.98
Profit and loss.....	39,550.86
Total.....	\$1,711,124.84
Road and equipment (\$18.438 per mile).....	\$1,677,689.52
Cash, materials and receivables.....	33,435.32
Total.....	1,711,124.84

The stock represents most of the former bonded debt. The bonds are a prior lien on part of the road, subject to which the road was sold.

The earnings were as follows:

Passengers.....	\$71,224.59
Freight.....	283,466.50
Mail, express, etc.....	11,797.73
Total (\$4.027.35 per mile).....	\$366,488.82
Expenses (73.73 per cent.).....	270,211.19
Net earnings (\$1,057.00 per mile).....	\$96,277.63
Interest.....	\$15,000.00
Dividends.....	45,000.00
Other payments.....	32,324.60
Balance.....	\$9,953.03

One dividend of 3 per cent. was declared and paid during the year. The road has a considerable business, most of it at pretty low rates.

LOCOMOTIVE RETURNS, JANUARY, 1879.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

NAME OF ROAD.	Number of Locomotives in service.	Number of miles operated.	MILEAGE.		MILES RUN TO		Average No. of freight cars hauled.	Average cost per freight car per mile, cents.	COST PER MILE IN CENTS FOR						AVERAGE COST OF		
			Total.	Average per Engine.	Ton of Coal.	Cord of Wood.			Plant of Oil.	Repairs.	Fuel.	Stores.	Miscellaneous.	Engines, firemen and wipers.	Total.	Coal per ton.	Wood per cord.
Allegheny Val. River Div.*	139	39	83,712	2,125	34.82		23.42	17.70	1.116	5.92	3.57	0.48	6.30	16.27			
Low Grade Div.*	120	17	36,968	2,176	25.82		19.10	17.10	0.797	1.36	4.09	0.61	5.86	11.92			
Atlantic & Great Western, 1st & 2d Divs.	228	83	261,535	3,151	31.75		17.51	13.40		3.62	6.34	0.46	5.61	16.70	1.90	2.85	
3d & 4th Divs.	197	50	170,162	3,403	29.80		27.77	13.40		4.58	5.62	0.34	5.35	16.49	1.56	2.85	
Mahoning Div.	88	33	109,684	2,070	33.02		23.49	14.80		3.00	5.28	0.34	5.57	14.10	1.04	2.85	
Atlantic & Gulf.	343	22	60,080	2,730		48.48	21.27			3.60	3.58	0.30	7.10	14.58		1.75	
Camden & Atlantic.	67	10	17,753	1,775	54.40		16.65	8.00		5.80	7.01	0.66	5.33	18.00	3.08		
Gen. Pac., Western Div.	128	29	60,626	2,401	47.88		15.31			6.49	12.29	0.49	0.45	8.07	27.70	5.75	0.00
Northern & San Pablo Div.	158	27	68,002	2,519	38.32		14.75			5.23	15.34	0.51	0.45	7.32	28.85	5.75	0.00
Valdosta Div.*	157	11	26,353	2,360	44.32		16.96			3.02	13.18	0.44	0.11	7.17	23.92	5.75	0.00
Tulare Div.*	171	13	26,188	2,014	34.58		12.28			4.00	16.66	0.61	0.29	7.97	29.73	5.75	0.00
Los Angeles, San Diego, Yuma & Wilmington Divs.*	417	23	72,080	3,134	53.37		14.00			5.15	10.98	0.51	0.26	6.46	23.36	5.75	0.00
California Pacific Div.	178	12	31,047	2,637	39.91		19.85			2.63	14.93	0.42	0.74	7.23	25.95	5.75	0.00
Stockton & Copperopolis.	40	2	4,824	2,412	38.96		23.08			1.34	15.93	0.32	0.38	6.82	24.79	5.75	0.00
Sacramento Div.*	120	33	67,248	2,038		27.59	15.89			10.58	21.74	0.50	0.49	9.35	42.06		6.00
Oregon Div.*	152	7	18,792	2,685	39.05		18.94			21.20	18.18	0.45	0.20	8.05	48.08	5.75	0.00
Truckee Div.*	205	26	62,883	2,515	36.41	28.44	16.91			6.24	18.36	0.43	0.42	7.53	34.20	5.75	0.00
Humboldt Div.*	200	10	40,880	2,625	42.50		19.94			10.53	13.80	0.37	0.41	7.61	32.72	5.75	0.00
Salt Lake Div.*	219	27	70,081	2,596	36.99		14.03			3.95	18.78	0.57	0.30	7.68	31.37	5.75	0.00
Chicago & Eastern Illinois	159	29	88,646	3,057	34.00		17.00			3.82	3.38	0.39		5.90	13.47		
Cin., Lafayette & Chicago.	75		31,299		20.03		12.25			3.54	7.84	0.37		6.27	18.02	2.25	
Cleve., Col., Cin. & Ind., Columbus Div.	138	58	148,750	2,560	35.05		28.18			2.76	5.20	0.47	0.62	6.36	15.47	1.75	2.75
Indianapolis Div.	207	60	165,472	2,758	39.67		25.08			3.26	4.95	0.55	1.09	5.71	15.56	1.75	2.75
Cincinnati Div.	130	33	67,376	2,647	41.16		23.23			1.14	5.22	0.52	0.80	5.61	15.29	2.02	2.75
Cleveland & Mahoning Valley	41	6	16,021	2,670	43.18		23.02	10.50		3.61	2.99	0.33	0.95	6.83	13.51	1.15	2.64
Cleveland & Pittsburgh*	225	84	175,162	2,186	39.37		17.61	15.30	1.007	3.64	2.99	0.43	2.09	6.81	15.06	1.04	3.32
Cleveland, Tuscarawas Valley & Wheeling	101	13	40,200	3,092	30.72		18.14	35.00		4.92	1.61	0.45		5.59	12.57		
Del., Lackawanna & Western, Bloomsburg Div.*	80	21	48,974	2,332		31.76				2.23		0.52		4.44	7.18		
Eel River	95	2	24,982	48.14	33.37		29.19			1.41	5.89	0.29		4.07	11.16	2.40	2.00
Erie & Pittsburgh*	98	29	72,297	2,493	35.61		19.25	13.90	0.950	3.81	4.50	0.40	1.84	6.27	16.82	1.61	1.61
Green Bay & Minnesota	240	13	27,310	2,101	43.17	39.3	23.06	11.32		1.48	5.92	0.24	0.03	6.45	12.32	3.80	2.25
Houston & Texas Central*	408	59	160,490	2,719	40.70	35.30	15.40			5.11	7.48	0.56	1.72	6.50	21.45	3.05	2.76
Ill. Cen., Chicago Div.	365	85	243,840	2,869	30.26		14.10	16.24		3.25	5.19	0.27		5.93	14.63	1.50	3.05
North Div.	345	55	131,762	2,396	28.67		16.02	11.70		3.77	5.45	0.23		5.53	14.99	1.50	3.05
Springfield Div.	113	11	28,779	2,616	30.48		15.11	10.39		1.80	4.29	0.28		5.33	11.70	1.25	3.05
Iowa Div.	401	42	103,555	2,460	29.97		17.16	10.43		3.26	8.86	0.23		5.95	18.31	2.30	5.65
Indianapolis, Cin. & Lafayette	226	45	113,059	2,512	35.03		19.98			3.65	6.03	0.25		5.80	15.73		
Jeff.ville, Madison & Ind.*	226	38	95,644	2,517	37.03	20.03	14.00	15.70	1.000	4.67	6.89	0.38	2.68	5.93	20.25	2.40	2.20
Kansas City, St. Jo. & Council Bluffs*	271	32	103,095	3,222	43.40		28.40	15.00		3.50	6.00	0.30		6.80	17.00	2.75	3.50
Kansas Pacific*	750	39	156,970	2,275	25.74		11.50			6.54	12.40	0.42		7.24	26.60	3.33	3.08
Little Rock, Miss. River & Texas.	100	4	6,564	1,641		19.00	7.00			5.20	6.80	0.77	2.64	10.54	25.95		2.25
Louisv'e & Nash., First Div.††	332	54	118,551	2,195	26.63		15.31	15.92	1.360	4.22	7.73	0.39	1.77	6.97	21.08	1.98	2.39
Second Div.††	200	38	87,043	2,091	28.11		15.93	15.21	1.500	4.01	6.97	0.37	2.37	6.14	19.86	1.92	2.63
Memph. Div.††	131	16	42,191	2,638	28.55		17.97	16.68	1.120	4.67	11.20	0.33	2.00	6.06	24.36	3.16	2.30
Nashville & Decatur Div.††	122	18	47,082	2,616	28.07		12.36	16.97	1.340	2.80	7.76	0.40	2.11	6.20	19.27	3.04	3.10
S. & N. Alabama R. R.††	186	29	83,670	2,885	30.00		10.71	14.64	1.390	4.47	7.61	0.66	1.30	6.60	20.03	2.23	2.42
Marj., Hought'n & Ontonagon	88	11	9,730	885	49.18		21.56	25.57		1.29	6.54	0.53		6.32	16.68	4.00	
Northern Central, Elmira & Canandaigua Divs.	147	44	81,867	1,891	30.08		20.00			7.24	6.16	0.80		5.79	19.79	1.80	2.08
Penn., New York Div.††	120	124	338,482	2,730	29.46		10.12			7.50	10.30	0.80		16.80	3.00	4.58	
Amboy Div.††	154	43	80,705	1,877	50.88		15.58			3.50	6.00	0.50		10.00	3.00	4.58	
Belvidere Div.††	103	36	55,217	1,534	33.05		15.23			4.20	9.20	0.80		14.00	3.00	4.58	
Philadelphia Div.††	191	147	404,582	2,752	25.95		14.25			3.70	4.20	0.50		8.40	1.00	2.72	
Midland Div.††	132	10	549,862	3,161	25.72		17.07			3.40	4.10	0.40		7.90	1.00	2.72	
Pittsb'g Div.††	225	103	544,348	2,820	24.58		11.58			4.20	4.20	0.40		7.40	1.00	2.72	
Tyone Div.††	107	29	59,625	2,036	20.58		24.04			4.80	4.90	0.40		10.10	1.00	2.74	
West Penn. Div.††	104	24	43,656	1,819	35.75		27.17			2.80	2.90	0.30		6.00	1.00	2.72	
Lowestown Div.††	50	7	20,211	2,887	28.36		16.39			1.9	3.60	0.40		5.90	1.00	2.74	
Bedford Div.††	57	3	7,200	2,400	32.14		23.81			2.00	3.20	0.30		5.50	1.00	2.81	
Pitts., Fort Wayne & Chicago, Eastern Div.*	371	153	485,479	3,173	37.94		22.71	13.20	0.906	1.47	3.91	0.35	1.63	6.12	13.48	1.48	1.48
Western Div.*	280	117	407,802	3,485	33.90		16.00	18.00	0.829	3.30	4.41	0.32	2.09	5.90	16.02	1.50	1.50
Pitts., Cin. & St. Louis, Little Miami Div.*	107	38	102,955	2,709	38.70		12.46	15.26	1.183	3.88	5.57	0.58	2.12	5.65	17.80	2.10	1.50
P. C. & St. L. Div.*	224	104	291,104	2,709	24.50		19.55	17.06	0.84	3.38	3.27	0.32	1.70	5.47	18.12	0.75	2.35
St. Louis, Iron Mt. & So., Arkansas Div.	325	32	90,405	2,825		40.40	16.80			3.00	6.07	0.48		6.43	15.98		2.45
St. Louis & San Francisco.	328		62,210		33.00		13.00			4.26	5.91	0.31		5.80	16.28	2.00	1.80
St. Louis & S. E., St. L. Div.	208		53,573		38.00		18.70			4.29	2.60	0.25		5.71	12.85	0.93	
Nashville Div.	145		47,013		29.10		10.60			4.49	2.49	0.27		6.36	13.61	0.68	
Wagon James††	128	15	32,457	2,162	47.96		21.19			2.70	8.00	0.40		11.10	3.80	3.65	
Year 1878.																	
Kansas Pacific††	750	63	2,051,068	22,004	28.02		12.63			6.42	12.18	0.43		6.72	25.75	3.38	3.41
Pitts., Cin. & St. Louis, P. C. & St. L. Div.*	224	112	2,871,756	25,640	29.94		20.69	19.32	0.790	5.87	2.91	0.41	2.10	5.67	16.06	0.79	2.45